T

CZECHOSLOVAKIA/Human and Animal Physiology. Blood Circulation. Heart.

Abs Jour: Ref Zhur-Biol., No 20, 1958, 93235.

Author : Smetana, J., Koszler, M., Poleska, D.
Inst :
Title : Experimental Hypothermia.

Orig Pub: Rozhl. chirurg., 1957, 36, No 4, 219-224.

Abstract: After hyperventilation with O_2 for 2 minutes, introduction of 0.25 - 0.50 mg of prostigmine and an injection into the pericardial cavity of 2.0 ml of phenergan provoked ventricular fibrillation only in 10 out of 35 dogs in a hypothermal state. Phenergan, however, may produce inflammatory changes in serous membranes and may be followed by severe bleeding, which was also observed as a result of heparin application during

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APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001239910004-2"

EXCERPTA MEDICA Sec 9 Vol. 9/8 Surgery Aug 55

PELESKA, B.

4505. PELEŠKA B. Ústavu pro exp. a klin. Chir., Praha. *Vliv citrátu sodného na obnovení činnosti srdeční po vykrvácení. The effect of sodium citrate on the restoration of cardiac activity after clinically fatal haemorrhage ROZHL. CHIR. 1954, 33/5-6 (268-294) Graphs 19 Tables 5

In 80 dogs, attempts at resuscitation were made 3 min. after clinical death with the aid of intra-arterial transfusion and artificial respiration. The best results were obtained by the use of citrate blood, with simultaneous administration of calcium and procaine. Heparinized blood yielded less favourable results, while pure citrate blood had completely negative results (without calcium and procaine), as had citrate blood with glucose and adrenaline. Wondrák - Litomerice (IX,1)

PELESKA, Bohumil

ZAK, Frantisek; PELESKA, Bohumil

Morphological changes in myocardium after defibrillation. Rozhl. chir. 36 no.11:727-730 Nov 57.

1. II. pathologickoanatomicky ustav KU v Praze, prednosta prof. Jedlicka Ustav klinicke a experimentalni chirurgie v Praze.

(MYOCARDIUM, anat. & histol.
morphol. changes induced by exper. defibrillation (Cz))

(VENTRICULAR FIBRILLATION, exper.
eff. of defibrill. on myocardial morphol. (Cz))

PELESKA, BOHUMIL

FISCHER, Jindrich; PELESKA, Bohumil

Morphological changes of the central nervous system in acute anemia. Rozhl. chir. 36 no.4:253-259 Apr 57.

1. Neuropathologicka laborator II. pathologicko-anatomickeho ustavu KU prof. V. Jedlickey, Praha Ustav klinicke a experimentalni chirurgie, Praha.

(CEREBRAL CORTEX, pathol.
in exper. cerebral anoxia (Cz))
(CEREBRAL ANOXIA, exper.
morphol. changes in cerebral cortex (Cz))

PAVROVSKY, J.; PELESKA, J.

Use of bipolar electrocoagulation in neurosurgery. Rozhl. chir., 31 no. 6-8:210-212 1952. (CLML 23:3)

1. Of the Surgical Clinic (Head--Docent J. Pavrovsky, M. D.) of Medical Faculty, Pilsen. 2. Own method of bipolar electrocoagulation (Peleska, M. D.).

DOSTALEK, Alois; PELESKA, Jaroslav

Some problems of planning. Pod org 17 no.4:164-166 Ap '63.

1. Zavody presneho strojirenstvi, Gottwaldov (for Dostalek).
2. Ceskomoravska-Kolben-Danek Praha (for Peleska).

PELESKA, Karel; MALEK, Josef

Effect of drying on the utilization of sawn timber in making windows. Drevo 19 no.5:166-169 My '64.

1. Institute of Woodworking Research and Development, Prague.

PELESKA, Karel

Air conditioning in the wood industry. Drevo 18 no. 7:247-253 Jl '63.

1. Vyzkumny a vyvojovy ustav drevarsky, Praha.

PELESKA, M.

The dependence of pupillographic values on age and on the initial width of the pupil. Sborn. lek. 67 no. 6:167-176 Je'65.

1. II. ocni klinika fakulty vseobecneho lekarstvi University Karlovy v Praze (prednosta: akademik J. Kurz).

EXCERPTA MEDICA Sec 20 Vol 2/8 Gerontology Aug 59

1118. **Dependence on age of the diameter of the pupil in the dark** KADLECOVÁ V., PELEŠKA M. and VAŠKO A. 2nd Eye Clin., Charles Univ., Prague *Nature (Lond.)* 1958, 182/4648 (1520–1521) Graphs 2

The authors measured the horizontal diameter of the pupil 906 times in 453 normal subjects in the dark using infra-red radiation and an image converter. The figures in subjects aged 8 to 85 were compared to others determined by flash photography after one hour in the dark in 208 subjects. Results were quite similar but the infra-red technique was certainly superior. The pupil diameter varies with age but not with sex or iris colour. Ametropia was not mentioned.

Miles – St. Louis, Mo. (XII, 20)

...A MEDICA Sec 12/Vol 13/5 Ophthalmology May 59

DEPENDENCE ON AGE OF THE DIAMETER OF THE PUPIL IN THE DARK - Kadlecová V., Peleška M. and Vaško A. 2nd Eye Clin., Charles Univ., Prague - NATURE (Lond.) 1958, 182/4648 (1520-1521) Graphs 2

The authors measured the horizontal diameter of the pupil 906 times in 453 normal subjects in the dark using infra-red radiation and an image converter. The figures in subjects aged 6 to 85 were compared to others determined by flash photography after one hr. in the dark in 208 subjects. Results were quite similar but the infra-red technique was certainly superior. The pupil diameter varies with age but not with sex or iris colour. Ametropia was not mentioned.

Miles - St. Louis, Mo. (XII.20)

PELESKA, M.

KADLECOVA, V.; PELESKA, M.

Pupillary diameter in light & dark in various age categories. Cesk. ofth. 13 no.4:273-282 Aug 57.

1. II. ocni klinika university Karlovy v Praze, Prednosta akademik J. Kurz.

(PUPILS
diameter in light & darkness, age factor (Cz))
(AGING, eff.
on pupillary diameter in light & darkness (Cz))

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001239910004-2"

KADLECOVA, Vera; PELESKA, Milos

Infrascopic studies. VI. Effect of cocaine on the pupil and its dependence on age as revealed by infrascopic study. Cesk. ofth. 14 no.3:168-173 June 58.

1. II. ocni klinika University Karlovy v Praze, prednosta akademik J. Kurz.

(COCAINE, eff.
on pupillary diameter, eff. of aging (Cz))
(PUPILS, eff. of drugs on
cocaine on pupillary diameter, eff. of aging (Cz))
(AGING, eff.
on cocaine action on pupillary diameter (Cz))

PELESKA, Milos

Pupillograph based on an infrared light converter. Cesk. ofth. 14 no.6: 399-410 Dec 58.

1. II. ocni klinika v Praze, prednosta akademik J. Kurz.
(OPHTHALMOLOGY, appar. & instruments
pupillograph based on infrared light converter (Cz))

PELESKA, M.

KADLECOVA, V.; PELESKA, M.

Effect of vegetative pupillary tone & iridic tissue on pupillary diameter in aging. Cesk. ofth. 13 no.4:282-293 Aug 57.

1. II. ocni klinika university Karlovy v Praze, prednosta akademik [redacted]

(PUPILS
diameter in aging, eff. of vegetative pupillary tone & iridic tissue (Cz))
(AGING, eff.
on pupillary diameter, eff. of vegetative pupillary tone & iridic tissue (Cz))

KADLECOVA, V., Doc., Dr.; PELESKA, M., Dr.

Orbicular reflex of the pupil investigated by infrascopic method. Cesk. ofth. 12 no.3:208-210 June 56.

1. Z II. ocni kliniky v Praze, prednosta akademik J. Kurz.
(PUPILS, physiology,
orbicular reflex of, infrascopic investigation (Cz))
(REFLEX,
pupillary orbicular, infrascopic investigation (Cz))

KADLECOVA, Vera, doc. Dr; PELESKA, Milos Dr

Infrascopic examination of the diameter of the pupil in darkness adaptation; infrascopic pupilometry. 1. Cesk.ofth. 11 no.4-5: 260-266 1955.

1. Z II. ocni kliniky Karlovy university v Praze. Prednosta: Akademik Jaromir Kurz.

(PUPILS, physiology

darkness adaptation, diameter measurement, infrascopic)

PELESKA, V.

Serious competitor of ariplanes in plant protection.

p. (2) of cover.
Vol 6, no. 5, Mar. 1956
MECHANISACE ZEMEDELSTVI
Praha

SO: Monthly List of East European Accessions (EEAL), LC, Vol. 5, no. 12
December 1956

PELESKA, B.; MARKOVA, J.; technical assistance: RABL, M.; VESELOVSKA, M.

"Kortikostimulator Prema" - an electronic stimulator for exciting the cerebral cortex. Rev.Czech. M.6 no.4:266-277 '60.

1. Institute for Clinical and Experimental Surgery, Prague - Kor. Director: Prof. B. Spacek, M.D.
(CEREBRAL CORTEX)
(ELECTRONICS)

KUCERA, J.; PELESKOVA, A.

Comments on congenital defects in perinatal mortality in 1962 in the Czechoslovakian SSR. Cesk. pediat. 19 no.9: 846-851 S '64.

1. Ustav pro peci o matku a dite v Praze (reditel doc. dr. M. Vojta; vedouci pediatrickeho useku doc. dr. K. Polacek, CSc.).

PELETMINSKIY, S.V. [Peletmyns'kyi, S.V.]

Volume and surface magnetoelastic waves in metals. Ukr.fiz. zhur. 3 no.5:611-616 S-O '58. (MIRA 12:2)

1. Fiziko-tekhnicheskiy institut AN USSR.
(Metals) (Sound waves)

AKHIYEZER, A.I.; BAR'YAKHTAR, V.G.; PELETMINSKIY, S.V.

Coupled magnetoelastic waves in ferromagnetic materials and ferroacoustic resonance [with summary in English]. Zhur. eksp. i teor. fiz. 35 no.1:228-239 Jl '58. (MIRA 11:10)

1. Fiziko-tekhnicheskiy institut AN Ukrainskoy SSR.
(Waves) (Sound) (Magnetic materials)

PELETMINSKIY, S. V.: Master Phys-Math Sci (diss) -- "Bound magnetic-elastic oscillations and ferroacoustic resonance". Khar'kov, 1959. 7 pp (Min Higher Educ Ukr SSR, Khar'kov Order of Labor Red Banner State U im A. M. Gor'kiy), 150 copies (KL, No 11, 1959, 115)

24(0) SOV/30-59-2-42/60

AUTHOR: Khalatnikov, I. M., Doctor of Physical and Mathematical Sciences

TITLE: Investigations of Low-temperature Physics (Issledovaniya po fizike nizkikh temperatur)

PERIODICAL: Vestnik Akademii nauk SSSR, 1959, Nr 2, pp 98-100 (USSR)

ABSTRACT: The 5th All-Union Conference on this problem took place in Tbilisi from October 27 to November 1, 1958. It was attended by physicists from Moscow, Khar'kov, Leningrad, Tbilisi, Sverdlovsk, and Kiyev. 4 fields of low-temperature physics were discussed: superliquidity of liquid helium II, supraconductivity, antiferromagnetism, magneto-resistive effect. The following reports and communications were heard: A. A. Abrikosov, L. P. Gor'kov reported on the investigation of the properties of supraconductive alloys. A. A. Abrikosov, L. P. Gor'kov, I. M. Khalatnikov spoke of properties of supraconductors in the high-frequency magnetic field. D. V. Shirkov and Chen' Chun'-syan' and Chzhou Si-shin', two young Chinese scientists working at Moscow University, described investigations for determination of the influence exercised by the Coulomb (Kulon) interaction of charges on supraconductivity. V. V. Tolmachev explained the

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nature of the so-called collective excitations of the Bose type in supraconductors. D. N. Zubarev, Yu. A. Tserkovnikov spoke of the thermodynamics of supraconductors and B. T. Geylikman, V. Z. Kresin of the thermal conduction of supraconductors. Yu. V. Sharvin, V. F. Gantmakher reported on experimental work with supraconductors. N. V. Zavaritskiy spoke of the measurement of the anisotropy of thermal conductivity in the supraconductive state. In a series of reports problems of the superliquidity of helium were discussed, which was discovered in 1938 by P. L. Kapitsa and the theory of which was set up in 1941 by L. D. Landau. E. L. Andronikashvili and his collaborators investigated the properties of rotating helium. V. P. Peshkov spoke of the effect of the formation of the boundary between superliquid and non superliquid helium. Guan Vey-yan', collaborator of the Institut fizicheskikh problem (Institute of Physical Problems) investigated the properties of the so-called jump in temperature of Kapitsa. I. M. Lifshits, V. D. Peschanskiy investigated galvanomagnetic phenomena in strong magnetic fields for metals with open Fermi surfaces. N. Ye. Alekseyevskiy, Yu. P. Gaydukov experimentally investigated the resistance anisotropy of gold monocrystals in the magnetic field. L. S. Kan, B. G. Lazarev combine the presence of

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a temperature minimum with the structural state of the metal. M. Ya. Azbel' reported on the quantum theory of metallic conductivity in the alternating electromagnetic and constant magnetic field. A. S. Borovik-Romanov reported on the weak ferromagnetism in antiferromagnetic samples of $MnCO_3$. N. M. Kreynes, Ye. A. Turov investigated the magnetic anisotropy of the antiferromagnetic monocrystals $CuSO_4$ and $CoSO_4$. R. A. Alikhanov reported on neutronographic investigations of antiferromagnetics. Ye. I. Kondorskiy and collaborators reported on the susceptibility of nickel and nickel-copper alloys at low temperatures. M. I. Kaganov, V. M. Tsukernik reported on kinetic phenomena in ferromagnetics at low temperatures. A. I. Akhiyezer, V. G. Bar'yakhtar, and S. P. Peletminskiy spoke of computations of the relaxation of the magnetic moment in ferromagnetic dielectrics at low temperatures. T. I. Sanadze spoke of observation results of paramagnetic resonance of terbium in the $TbNO_3 \cdot 6H_2O$ nitrate. G. R. Khutsishvili gave a theoretical analysis of the orientation of the nuclear spin in the Overhauser (Overkhauzer) effect in nonmetals. B. N. Samoylov, N. M. Reynov and collaborators reported on obtaining orientated nuclei. R. F. Bulatova, V. S. Kogan and B. G. Lazarev showed that hydrogen isotopes in solid state have different structures. I. A. Gindin, B. G. Lazarev, Ya. D. Starodubov and V. I. Khotkevich detected polymorphism in a number of metals at low temperatures. E. L. Andronikashvili, V. P. Peshkov and M. P. Malkov reported on the stage of development of foreign scientific research work in the field of low-temperature physics. At the end of the Conference P. L. Kapitsa spoke of his successful development of investigations in the field of low-temperature physics. The participants of the Conference visited the Institut fiziki Akademii nauk Gruzinskoy SSR (Physics Institute of the Academy of Sciences of the Gruzinskaya SSR) and the Physics Faculty of Tbilisi University as well as the building of the new research atomic reactor near Tbilisi.

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Peletminskiy, S. P.

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001239910004-2"

24(3) SOV/56-36-1-29/62

AUTHORS: Akhiyezer, A. I., Bar'yakhtar, V. G., Peletminskiy, S. V.

TITLE: On the Theory of Relaxation Processes in Ferroelectrics at Low Temperatures (K teorii relaksatsionnykh protsessov v ferrodielektrikakh pri nizkikh temperaturakh)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36, Nr 1, pp 216-223 (USSR)

ABSTRACT: The authors developed a theory of the relaxation of the magnetic moment of a ferroelectric and showed that, because of the exchange interaction between the spin waves, above all the Bose distribution of the spin waves with the given nonequilibrium values of the square and the projection of the magnetic moment on to the axis of the slightest magnetization occurs. The Hamiltonian of interaction among spin waves and between spin waves and phonons can be represented in the form $\mathcal{H}_{int} = \mathcal{H}_e + \mathcal{H}_w + \mathcal{H}_a + \mathcal{H}_p$. Here $\mathcal{H}_e$ and $\mathcal{H}_w$ denote the Hamiltonians of exchange interaction and magnetic interaction respectively, $\mathcal{H}_a$ - the energy of anisotropy, and $\mathcal{H}_p$ - that Hamiltonian which describes the interaction between spin waves and phonons. When

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On the Theory of Relaxation Processes in Ferroelectrics at Low Temperatures

determining $\mathcal{H}_e$ it is necessary to proceed from the expression for the exchange energy of the ferromagnetic:

$$\mathcal{H}_e = \frac{\alpha}{2}\int \frac{\partial M_i}{\partial x_i}\frac{\partial M_1}{\partial x_1}\,dV,$$ where M is the magnetic moment of the volume unit and α is the exchange integral. In the following, the expressions for $\mathcal{H}_W$, $\mathcal{H}_\varepsilon$, and $\mathcal{H}_p$ are written down. The authors then give the formulas for the variation of the number of spin waves with the momentum $\vec{k}$ in the unit of time, which are caused by the above-mentioned interactions. By using expressions for the collision operators, it is possible to determine the mean probabilities of the various processes of interaction between spin waves and phonons. Above all, the average probabilities for spin wave - spin wave scattering (due to exchange interaction), of the splitting up of a spin wave into two, and of the fusion of two spin waves into one, are written down. The probabilities of the other processes are lower than those of the two last-mentioned. An equation,

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On the Theory of Relaxation Processes in Ferroelectrics at Low Temperatures

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which is given, determines the quantity of heat transferred from the spin system to the lattice, and a further equation is the law for the conservation of energy. Also relaxation times are calculated. The authors finally thank Academician L. D. Landau and M. I. Kaganov for their valuable suggestions. There are 5 references, 4 of which are Soviet.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk Ukrainskoy SSR (Physico-Technical Institute of the Academy of Sciences, Ukrainskaya SSR)

SUBMITTED: July 5, 1958

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ACCESSION NR: AP5004395 S/0056/65/048/001/0204/0221

28
27
B

AUTHOR: Akhiyezer, A. I.; Bar'yakhtar, V. G.; Peletminskiy, S. V.

TITLE: Contribution to the theory of transfer phenomena in metals in strong magnetic fields

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 48, no. 1, 1965, 204-221

TOPIC TAGS: electron scattering, phonon scattering, transport phenomena, electron phonon interaction, kinetic coefficient, heat transfer, thermal emf

ABSTRACT: The article is devoted to a study of the effect of various mechanisms for the scattering of electrons and phonons on transverse transfer phenomena in metals in strong magnetic fields, and to a determination of the roles played by electrons and phonons in heat transfer. The case of closed Fermi surfaces is considered, and it is assumed that $\omega_H \tau_e >> 1$ (ω_H -- electron Larmor frequency and τ_e -- mean free flight time of the electron in the absence of a magnetic field). In this case the electric field and the gradients of the temperature ...

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ACCESSION NR: AP5004395

tions can be written for the electron and phonon distribution functions. An important feature of these equations is that they do not contain kinematic terms and that inhomogeneity gradients occur in the collision integrals. These equations are used to derive general formulas for the transport coefficients, with account of the phonon-electron drag. It is shown that solutions of the transport equations can be obtained for weak electric fields and small inhomogeneities, and that in sufficiently pure metals the heat current transported by the phonons is appreciably larger than the heat current carried by the electrons. In the quantum mechanical case, the phonon heat conductivity should exhibit the same oscillations as the electron transport coefficients (except for a shift in the position of the maxima). The relative amplitude of the quantum oscillations of all transport coefficients, connected with electron-scattering by both impurities and lattice vibrations, can be of the order of unity. The electron-phonon drag is shown to affect the magnitude of the thermal emf appreciably. Orig. art. has 47 formulas.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk Ukrainskoy SSR (Physico-technical Institute, Academy of Sciences UkrSSR)

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L 31961-65

ACCESSION NR: AP5004395

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SUB CODE: NP, EM

NR REF SOV: 007

OTHER: 002

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SOV/56-37-1-27/64

24(5)

AUTHORS: Volkov, D. V., Peletminskiy, S. V.

TITLE: On the Lagrangian Formalism for Spin Variables (O lagranzhevom formalizme dlya spinovykh peremennykh)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 37, Nr 1(7), pp 170-178 (USSR)

ABSTRACT: In the present paper, it is shown that the class limitations of admissible variations postulated by I. Schwinger (Ref 1) are not necessary. A change of the class of admissible variations permits the introduction of spin variables (for any spin value) into the general scheme of Schwinger's variation principle, both in the non-relativistic and in the relativistic case. The Lagrangian formalism for the spin variables leads in the relativistic case to a natural introduction of the proper time into theory. In the non-relativistic case, the spin variables are described by the vector $\vec{s}$. The equations of motion and the operator properties of the vector $\vec{s}$ are determined on the basis of the application of the action principle written in operator form to the Lagrangian function $L = \frac{1}{2} i \left[\vec{s}, \dot{\vec{s}}\right] - H(\vec{s})$. $H(\vec{s})$ denotes any function

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On the Lagrangian Formalism for Spin Variables SOV/56-37-1-27/64

of $\vec{s}$ which agrees with the Hamiltonian function of the system, $\dot{\vec{s}}$ the derivation of the operator $\vec{s}$ with respect to time in Heisenberg's representation. The square brackets denote the commutator. The first summand in the above formula corresponds to the kinematic part of the Lagrangian function. The course of the calculation is followed step by step. The vector $\vec{s}$ really describes, according to these calculations, the spin degrees of freedom of the particle. The authors then show that the principle of steady action $\int_{t_s}^{t_2}\left\{i\left[\delta\vec{s},\dot{\vec{s}}\right]-\delta H\right\}dt=0$ is really satisfied in the class of admissible variations discussed here. The results of the first part show the following: The data on the equations of motion and on the operator properties of the vector $\vec{s}$, which were determined on the basis of application of the operator-like action principle to the above-mentioned Lagrangian function are in internal agreement and describe correctly the properties of the spin variables. The second part describes the introduction of spin variables into the scheme of the

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On the Lagrangian Formalism for Spin Variables SOV/56-37-1-27/64

Lagrangian formalism in the relativistic case. The four-dimensional vector Γ_μ is investigated as a natural relativistic generalization of the spin vector $\vec{s}$. The four-dimensional vectors of the coordinate and of the momentum are denoted x_μ and p_μ. The Lagrangian function is written down in the form $\mathcal{L} = \frac{1}{8} i \left[\Gamma_\mu, \dot{\Gamma}_\mu\right] - \frac{1}{4} \left(\left\{x_\mu, \dot{p}_\mu\right\} - \left\{\dot{x}_\mu, p_\mu\right\}\right) - \mathcal{H}$, $\mathcal{H}$ denoting a certain function of Γ_μ, x_μ, p_μ. Finally, the equations of motion and the exchange relations are written down. The authors thank A. I. Akhiyezer and P. I. Fomin for useful discussions. There are 11 references, 9 of which are Soviet.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk Ukrainskoy SSR (Physical-technical Institute of the Academy of Sciences of the Ukrainskaya SSR)

SUBMITTED: January 29, 1959

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24(3) SOV/56-37-2-18/56

AUTHOR: Peletminskiy, S. V.

TITLE: Coupled Magneto-elastic Vibrations in Antiferromagnetics

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 37, Nr 2(8), pp 452-457 (USSR)

ABSTRACT: This article treats of the phenomenological theory of coupled magneto-elastic vibrations in an antiferromagnetic substance. The interrelation between the elastic and the magnetic waves is caused by magnetostriction with a spontaneous magnetization. In an elastically deformed antiferromagnetic substance an interaction between the elastic and magnetic waves (spin waves) must occur owing to magnetostriction and the ponderomotoric effects caused by the spontaneous magnetization. If the medium is highly conductive the magneto-elastic waves are equivalent to the waves propagating in metals under the action of an external magnetic field. This interaction between elastic and magnetic waves leads to a change of sound velocity and to an additional sound absorption. These changes are most pronounced if the frequencies and the wave vectors of both the elastic and magnetic wave coincide. In this paper these problems are treated for an antiferromagnetic substance in a way similar

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to that found in earlier papers by A. I. Akhiyezer, V. G. Bar'yakhtar, and S. V. Peletminskiy (Ref 1) for ferromagnetics. First a rather long expression is written down for the free energy $\mathcal{H}$ of the antiferromagnetic substance taking into account the coupling between the sound vibrations and the magnetic vibrations. The equations for the motion of the magnetic moments $\vec{M}_1$ and $\vec{M}_2$ read as follows:

$$\frac{\partial \vec{M}_1}{\partial t} + \frac{\partial}{\partial x_k}(\vec{M}_1 \dot{u}_k) = g\left[\vec{M}_1 \vec{H}_1^{(e)}\right] - \frac{\lambda}{M^2}\left[\vec{M}_1\left[\vec{M}_1 \vec{H}_1^{(e)}\right]\right]$$

$$\frac{\partial \vec{M}_2}{\partial t} + \frac{\partial}{\partial x_k}(\vec{M}_2 \dot{u}_k) = g\left[\vec{M}_2 \vec{H}_2^{(e)}\right] - \frac{\lambda}{M^2}\left[\vec{M}_2\left[\vec{M}_2 \vec{H}_2^{(e)}\right]\right],$$

where $\vec{H}_1^{(e)}$ and $\vec{H}_2^{(e)}$ denote the effective magnetic fields which act upon the magnetic moments of the first and second sublattice, respectively. To these equations of motion there must be added Maxwell's equations and the equations of elasticity:

Coupled Magneto-elastic Vibrations in Antiferromagnetics SOV/56-37-2-18/56

$$\text{curl}\,\vec{h} = \frac{1}{c}\frac{\partial \vec{d}}{\partial t} + \frac{4\pi}{c}\vec{j}\,, \quad \text{curl}\,\vec{e} = -\frac{1}{c}\frac{\partial}{\partial t}(\vec{h} + 4\pi\vec{M})\,,$$

$\vec{j} = \sigma\left(\vec{e} + \frac{1}{c}\left[\dot{\vec{u}}\vec{B}\right]\right)$, $\varrho\ddot{\vec{u}} = \vec{f}$, where $\vec{f}$ denotes the force referred to unit volume, $\vec{M} = \vec{M}_1 + \vec{M}_2$, $\vec{B} = \vec{H} + 4\pi\vec{M}$ holding. The course of the mathematical derivation is briefly outlined. The absorption coefficient of the magnetoelastic vibrations is specified by $\Gamma = -\frac{1}{\mathcal{H}}\frac{d\mathcal{H}}{dt}$, where $\overline{d\mathcal{H}/dt}$ denotes the value of a herein given volume integral averaged over time. This system of equations, consisting of the equations of motion, Maxwell's equations, and the equations of elasticity is investigated. This system must first of all be linearized. The author assumes for reasons of simplicity that the medium is isotropic with respect to magnetostriction. The equations of motion of the magnetic moments are written down explicitly. In the sequel only the case is investigated in which the wave propagates parallel to the axis of easiest magnetizability. The absorption coefficient of magnetoelastic vibrations can

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Coupled Magneto-elastic Vibrations in Antiferro-magnetics SOV/56-37-2-18/56

be determined in a way similar to that used for ferromagnetics and ferrodielectrics . The author expresses his gratitude to A. I. Akhiyezer, V. G. Bar'yakhtar, and M. I. Kaganov for discussing the results of this paper. There are 4 Soviet references.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk Ukrainskoy SSR (Physical-technical Institute of the AS Ukr SSR)

SUBMITTED: February 9, 1959

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S. PELETMINSKIY

24(0) SOV/53-67-4-7/7

AUTHOR: Chentsov, R.

TITLE: The Fifth All-Union Conference on the Physics of Low Temperatures (5-ye Vsesoyuznoye soveshchaniye po fizike nizkikh temperatur)

PERIODICAL: Uspekhi fizicheskikh nauk, 1959, Vol 67, Nr 4, pp 743-750 (USSR)

ABSTRACT: This Conference took place from October 27 to November 1 at Tbilisi; it was organized by the Otdeleniye fiziko-matematicheskikh nauk Akademii nauk SSSR (Department of Physico-mathematical Sciences of the Academy of Sciences, USSR), the Akademiya nauk Gruzinskoy SSR (Academy of Sciences, Gruzinskaya SSR), and the Tbilisskiy gosudarstvennyy universitet im. Stalina (Tbilisi State University imeni Stalin). The Conference was attended by about 300 specialists from Tbilisi, Moscow, Khar'kov, Kiyev, Leningrad, Sverdlovsk, and other cities as well as by a number of young Chinese scientists at present working in the USSR. About 50 lectures were delivered which were divided according to research fields. . . . IV. Magnetism. A. S. Borovik-Romanov (IFP) delivered a report on investigations he carried out of the anisotropy of the weak ferromagnetism in monocrystal samples of the antiferromagnetic $MnCO_3$ (the effect of anisotropy was predicted by the thermodynamical theory developed by Dzyaloshinskiy). In the course of the discussion R. A. Alikhanov (IFP) spoke about neutronographical investigations he carried out of the magnetic structure of $MnCO_3$ and $FeCO_3$ at low temperatures. P. L. Kapitsa stressed the importance of the method based upon Dzyaloshinskiy's theory. N. M. Kreynes (VNIIFTRI), whose lecture was read by A. S. Borovik-Romanov, reported on measurements carried out by him (in the IFP) of the magnetic anisotropy of the antiferromagnetic $CuSO_4$- and $CoSO_4$-monocrystals.

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Ye. A. Turov (IFM AN SSSR, Sverdlovsk) spoke about his theoretical investigations of the magnetisability, the susceptibility, the specific heat, and the resonance frequencies of antiferromagnetics and weak ferromagnetics. A. I. Sudovtsov and Ye. Ye. Semenenko (KhFTI) spoke about measurements of the electric resistance of iron in magnetic fields in a wide temperature range with simultaneous plotting of the magnetization curve. N. V. Vol'kenshteyn, G. V. Fedorov, E. V. Galoshina and M. I. Turchinskaya (IFM AN SSSR) spoke about measurements of magnetization and the Hall effect of polycrystalline samples, nickel and Ni_3Mn at low temperatures. Ye. I. Kondorskiy, V. Rode, U. Gofman and Chang, Shou-ch'un (MGU) gave a report on susceptibility measurements on nickel and its alloys with copper at low temperatures; T. I. Sanadze (TGU) spoke about the spectrum of the paramagnetic resonance of Tb^{3+} in terbium nitrate at temperatures of liquid hydrogen. M. I. Kaganov and V. M. Tsukernik (KhFTI) dealt with the kinetic phenomena in ferromagnetics at low temperatures and with calculation of relaxation time; A. I. Akhiyezer, V. Bar'yakhtar and S. Peletminskiy (KhFTI) carried out a theoretical investigation of the relaxation of the magnetic moment in ferrodielectrics; Vlasov (IFM AN SSSR) showed that a linearly polarized elastic (ultrasonic) wave of a frequency of 10^7 cycles when passing through a ferromagnetic substance in the direction of the magnetic field, is subjected to a turn of the polarization plane of the order of 10^{-3} - 10^{-4} radian/cm oersted. M. I. Kaganov pointed out that in this connection yet another phenomenon may be observed, namely the resonance absorption of ultrasonics if the wavelength is equal to the radius of the Larmor orbit of the electron. . V. Various Questions. One of the most interesting lect...

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S/056/60/038/06/07/012
B006/B056

AUTHORS: Akhiyezer, I. A., Peletminskiy, S. V.

TITLE: Application of Quantum-field Theoretical Methods for the Investigation of the Thermodynamic Properties of a Gas of Electrons and Photons

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 38, No. 6, pp. 1829 - 1839

TEXT: The idea and the method of applying the quantum field theory for the purpose of investigating the thermodynamic properties of systems of interacting particles date back to Matsubara. A. A. Abrikosov, L. P. Gor'kov, I. Ye. Dzyaloshinskiy, Ye. S. Fradkin, A. A. Vedenov, and A. I. Larkin have already occupied themselves with various forms of applying this method. It was the aim of the present paper to derive the thermodynamic potential of a system of electrons, positrons, and photons in consideration of the interaction between them with an accuracy up to and including terms with $e^4 \ln e^2$, where e is the electron

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Application of Quantum-field Theoretical Methods for the Investigation of the Thermodynamic Properties of a Gas of Electrons and Photons

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B006/B056

charge. First, the idealized problem of the thermodynamic potential of an electron-photon gas with a homogeneous, positively charged background is investigated, in which the background compensates the negative electron charge, so that the task consists in determining the thermodynamic potential of an equilibrium system. In the following, also the part played by the ions existing in physically real systems is taken into account (at not too low temperatures), and finally one goes over to the problem of the energy of black-body radiation in consideration of the interaction between the photons and the electron-positron pairs. After a detailed explanation of the fundamental relations of the thermodynamic perturbation theory and application of Matsubara's quantum-field theoretical method, and after a discussion of the invariance properties of the polarization operator, the problem proper, i. e., that of the thermodynamic potential, is dealt with. Divergences appearing in the high-momentum region of the virtual particles are removed by renormalizing the electron charge and mass, and by redetermination of the vacuum level. General expressions are derived, which take relativistic

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Application of Quantum-field Theoretical Methods for the Investigation of the Thermodynamic Properties of a Gas of Electrons and Photons

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B006/B056

effects into account, and asymptotic formulas are derived for the exchange and correlation energies. Finally, corrections to the black-body radiation energy for the interaction between photons and electron-positron pairs are calculated. The authors thank A. I. Akhiyezer for advice and discussions. There are 1 figure and 9 references: 6 Soviet, 1 American, and 1 Japanese.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk Ukrainskoy SSR (Institute of Physics and Technology of the Academy of Sciences Ukrainskaya SSR)

SUBMITTED: January 12, 1960

Card 3/3

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83763

S/056/60/039/003/015/045
B006/B063

9.4300 (1035,1138,1143)

AUTHORS: Bar'yakhtar, V. G., Peletminskiy, S. V.

TITLE: The Theory of Relaxation of the Magnetic Moment in Ferromagnetics

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 39, No. 3(9), pp. 651-656

TEXT: Relaxation effects in ferromagnetics are due to various interaction processes between spin waves and conduction electrons. The sd-exchange interaction between spin waves and conduction electrons attains a maximum in the temperature range $\theta_c \gg T \gg 4\theta_c(Ja/\hbar v_0)^2$, where J is the sd-exchange integral, a the lattice constant, and v_0 the limiting Fermi velocity. This exchange interaction causes a quasi-equilibrium distribution of conduction electrons and spin waves, which corresponds to a certain magnetic moment of the body. The present paper shows that this quasi-equilibrium distribution is established with a given non-equilibrium value of the projection of the magnetic moment onto the axis of easiest magnetization. Only there-

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The Theory of Relaxation of the Magnetic Moment in Ferromagnetics

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upon the equilibrium value of the magnetic moment is gradually attained as a result of a relativistic spin-orbit interaction between spin waves and conduction electrons. As this interaction is weak as compared to the sd-exchange interaction, the relaxation of the magnetic moment takes place slowly as compared to the establishment of the quasi-equilibrium distribution function. With $v_o \sim 10^8$ cm/sec, $\Theta_C \sim 10^3$ °K, $\varepsilon_o \sim 1$°K, $n = 10^{22}\,cm^{-3}$, and $a \sim 10^{-8}$ cm one obtains the relaxation time of the projection of the magnetic moment onto the axis of easiest magnetization as being of the order of $10^{-8} - 10^{-9}$ sec. The relaxation time is found to be independent of temperature: $\frac{1}{\tau} \approx \frac{8(\pi^2-8)}{3\cdot 137}\left(\frac{v_o k_o}{cq}\right)^2 \frac{c}{v_o}\left(\frac{\varepsilon_o \Theta_c}{E^{*2}}\right)^{1/2} \frac{\mu M_o}{\hbar}$. The authors thank A. I. Akhiyezer for discussions and for having suggested this work, and M. I. Kaganov also for discussions. There are 4 references: 3 Soviet and 1 US.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk Ukrainskoy SSR (Institute of Physics and Technology of the Academy of Sciences Ukrainskaya SSR)

SUBMITTED: March 23, 1960

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86903

S/056/60/039/005/020/051
B006/B077

24.2200

AUTHORS: Akhiyezer, I. A., Peletminskiy, S. V.

TITLE: Theory of the Magnetic Properties of a Nonideal Fermi Gas at Low Temperatures

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 39, No. 5(11), pp. 1308-1316

TEXT: This is a study based on the quantum field theory of the effect of the interaction between particles upon the magnetic properties, especially the oscillations of the magnetic moment of a Fermi gas. The authors chose a simple model within the microscopic theory assuming that the interaction of the particles is due to short-range forces and the system in question can be regarded as a gas. Expressions are found for the change of period and the amplitude of the oscillation of the magnetic moment due to the interaction between the particles. The results are valid in a moderate temperature range ($p_0 f_0 \ll 1$, $\omega/\mu \ll 1$, $(\omega/\mu)^2 (p_0 f_0)^2 \ll (\beta\mu)^{-1} \ll 1$; $\mu = p_0^2/2m$ is the chemical potential, and $\omega = e\mathcal{H}/mc$ is the Larmor frequency of the

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Theory of the Magnetic Properties of a Nonideal Fermi Gas at Low Temperatures

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particles in the $\mathcal{H}$-field; β is the reciprocal temperature, f_0 the scattering amplitude of zero-energy particles for $\mathcal{H} = 0$). The following expression is obtained for the oscillations of the gas density

$$\mathfrak{N}_r^{osc} = \frac{m}{\pi}\left(\frac{m\omega}{r}\right)^{1/2}\frac{1}{\beta}\sin\left[\frac{2\pi r}{\omega}(\mu+\Delta\mu)-\frac{\pi}{4}\right]\times$$
$$\times\sum_{k=0}^{\infty}\exp\left\{-\frac{2\pi^2 r}{\beta\omega}\frac{m^*}{m}(2k+1)-\frac{4\pi r}{\omega\tau}\left[(2k+1)^2-\frac{1}{2}\right]\right\}. \qquad (22)$$

for the oscillations of the thermodynamic potential per unit of volume:

$$\Omega = \Omega_0 + 2\sum_{r=1}^{\infty}(-1)^r\Omega_r,$$
$$\Omega_r^{osc} = -\frac{1}{2\pi^2}\left(\frac{m\omega}{r}\right)^{3/2}\frac{1}{\beta}\cos\left[\frac{2\pi r}{\omega}(\mu+\Delta\mu)-\frac{\pi}{4}\right]\times$$
$$\times\sum_{k=0}^{\infty}\exp\left\{-\frac{2\pi^2 r}{\beta\omega}\frac{m^*}{m}(2k+1)-\frac{4\pi r}{\omega\tau}\left[(2k+1)^2-\frac{1}{2}\right]\right\}. \qquad (23)$$

and for the oscillating part of the magnetic moment:

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$$M_r^{osc} = -\frac{1}{\pi}\frac{e}{c}\left(\frac{m}{r\omega}\right)^{1/2}\frac{\mu}{\beta}\sin\left[\frac{2\pi r}{\omega}(\mu+\Delta\mu)-\frac{\pi}{4}\right]\times$$
$$\times\sum_{k=0}^{\infty}\exp\left\{-\frac{2\pi^2 r}{\beta\omega}\frac{m^*}{m}(2k+1)-\frac{4\pi r}{\omega\tau}\left[(2k+1)^2-\frac{1}{2}\right]\right\}. \quad (24)$$

If $\omega\tau \gg 1$, then $M_r^{osc} = -\frac{1}{2\pi}\frac{e}{c}\left(\frac{m}{r\omega}\right)^{1/2}\frac{\mu}{\beta}\sin\left[\frac{2\pi r}{\omega}(\mu+\Delta\mu)-\frac{\pi}{4}\right]\mathrm{sh}^{-1}\frac{2\pi^2 r}{\beta\omega}\frac{m^*}{m}$. $\mathcal{N} = -\frac{\partial\Omega}{\partial\mu}$; $M = -\frac{\partial\Omega}{\partial\mathcal{H}} = -\frac{e}{mc}\frac{\partial\Omega}{\partial\omega}$. It is especially pointed out that the oscillation amplitude contains a factor which increases exponentially if the magnetic field $\mathcal{H}$ decreases. The authors thank A. I. Akhiyezer and I. M. Lifshits for their suggestions; Yu. A. Bychkov for discussions. L. D. Landau, A. M. Kosevich, V. M. Galitskiy, A. A. Abrikosov, L. P. Gor'kov, I. Ye. Dzyaloshinskiy, Ye. S. Fradkin, and V. G. Skobov are mentioned. There are 3 figures and 7 references: 5 Soviet, and 2 British.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk Ukrainskoy SSR (Institute of Physics and Technology of the Academy of Sciences Ukrainskaya SSR)

SUBMITTED: May 25, 1960

Card 3/3

89228

S/056/61/040/001/034/037
B102/B212

24.7900 (1147, 1158, 1160, 1144)

AUTHORS: Akhiyezer, I. A., Bar'yakhtar, V. G., Peletminskiy, S. V.

TITLE: Theory of high-frequency magnetic susceptibility of a ferrodielectric at low temperatures

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 40, no. 1, 1961, 365-374

TEXT: The ferromagnetic resonance line widths are commonly calculated by phenomenological methods using the relaxation term in accordance with Landau-Lifshits or Bloch. The authors of the present paper wanted to calculate the ferromagnetic resonance line shape by using quantum theory and basing on the microscopic theory of spin wave interactions. The magnetic susceptibility tensor is not determined as usually with the help of an equation of motion but with an application of field theory using Green's two-time function of spin waves. The calculation of Green's spin wave function is based on a Hamiltonian which takes into account both exchange interactions and relativistic interactions between spin waves; the interaction of these spin waves with lattice vibrations is neglected.

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Theory of high-frequency magnetic... S/056/61/040/001/034/037 B102/B212

The method employed is well suited to compute transverse components of the magnetic susceptibility tensor, used to determine the resonance line shape. If the magnetic susceptibility as a function of frequency and wave vector is known, it is possible to find the behavior of the relaxation of a magnetic moment. The relationship between susceptibility and Green function is investigated first. One obtains $\chi_{il}(\vec{k},\omega) = K^R_{il}(\vec{k},\omega)$, where the retarded two-time Green function is defined by

$$K^R_{il}(\vec{r}-\vec{r}',t-t') = i\theta(t-t')\langle[\hat{M}_i(\vec{r},t), \hat{M}_l(\vec{r}',t')]\rangle, \quad \theta(t) = \begin{cases} 0 & t<0 \\ 1 & t>0 \end{cases}$$

$$\langle f\rangle = Sp\varrho_0 f,$$

with a Fourier expansion $K^R_{il}(\vec{r},t) = \frac{1}{(2\pi)^4}\int_{-\infty}^{+\infty} \exp(-i\omega t+i\vec{k}\vec{r})K^R_{il}(\vec{k},\omega)d\vec{k}d\omega$. ϱ_0 denotes the density matrix without the external field. It is shown how the relaxation of the magnetic moment can be investigated if χ_{il} is known. Let there be a magnetic-moment distribution $\vec{m}^0(\vec{r})$ at $t=0$, assumed to be in equilibrium in the presence of a magnetic field $\vec{h}^0(\vec{r})$. This field is connected with the initial magnetic moment distribution by the following

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relation: $m_i^o(\vec{k}) = \chi_{il}(\vec{k},\omega)h_l^o(\vec{k})|_{\omega=0}$. The variable magnetic field is described by $\vec{h}(\vec{r},t) = \theta(-t)e^{\varepsilon t}\vec{h}^o(\vec{r})$, $\varepsilon \to +0$; and the relaxation of the magnetic moment is expressed by the relation:

$m_i(\vec{r},t) = -\frac{i}{(2\pi)^4}\int d\vec{k}e^{i\vec{k}\vec{r}}k_l^o(\vec{k})\int_{-\infty}^{\infty} d\omega \frac{e^{-i\omega t}}{\omega}\left[\chi_{il}(\vec{k},\omega) - \chi_{il}^*(\vec{k},\omega)\right]$. The relaxation is thus determined by the anti-hermitean part of the tensor χ_{il}; this part also determines the energy absorption of the variable magnetic field. In the following the connection between $K_{il}^R(\vec{r},t)$ and the Matsubara-Green function $\mathcal{K}_{il}(\vec{r},\tau)$ is defined by $\mathcal{K}_{il}(\vec{r}-\vec{r}',\tau-\tau') = \langle T_\tau\{\hat{M}_i(\vec{r},\tau)\hat{M}_l(\vec{r}',\tau')\}\rangle$, $\hat{M}_i(\vec{r},\tau) = e^{\mathcal{H}\tau}M_i(\vec{r})e^{-\mathcal{H}\tau}$, where T_τ is the chronological operator with respect to the variable τ, which is examined by employing the diagram technique. Using a method of A. A. Abrikosov, L. P. Gor'kov, I. Ye. Dzyaloshinskiy, and Ye. S. Fradkin one obtains: $\chi_{il}(\vec{k},\omega) = K_{il}^R(\vec{k},\omega) = \mathcal{K}_{il}(\vec{k},-i\omega+0)$. The magnetic susceptibility of a dielectric described by the Hamiltonian $\mathcal{H} = \mathcal{H}_0 + \mathcal{H}_3 + \mathcal{H}_4$ is then computed. $\mathcal{H}_0 = \sum_{\vec{k}} \varepsilon_{\vec{k}} c^+_{\vec{k}} c_{\vec{k}}$, where $\varepsilon_{\vec{k}}$ denotes the spin wave energy, $\mathcal{H}_3$ and $\mathcal{H}_4$ are given by

$$\mathcal{H}_3 = \frac{1}{\sqrt{V}} \sum_{1,2,3} \{\Phi(1, 2; 3) c_1^+ c_2^+ c_3 \Delta(k_1 + k_2 - k_3) + \text{к. с.} + \Phi_1(1, 2, 3) c_1^+ c_2^+ c_3^+ \Delta(k_1 + k_2 + k_3) + \text{к. с.}\},$$

$$\mathcal{H}_4 = \frac{1}{V} \sum_{1,2,3,4} \{\Psi(1, 2; 3, 4) c_1^+ c_2^+ c_3 c_4 \Delta(k_1 + k_2 - k_3 - k_4) + \Psi_1(1, 2, 3; 4) c_1^+ c_2^+ c_3^+ c_4 \Delta(k_1 + k_2 + k_3 - k_4) + \text{к. с.} + \Psi_2(1, 2, 3, 4) c_1^+ c_2^+ c_3^+ c_4^+ \Delta(k_1 + k_2 + k_3 + k_4) + \text{к. с.}\}. \quad (19)$$

$$\varepsilon_k = \sqrt{A_k^2 - |B_k|^2}, \text{ где}$$

$$A_k = \Theta_c (ak)^2 + \mu (H_0 + \beta M_0) + 2\pi\mu M_0 \sin^2 \vartheta_k, \quad B_k = 2\pi\mu M_0 \sin^2 \Theta_k e^{2i\varphi_k},$$

μ denotes the double Bohr magneton, a is the lattice constant, Θ_c is of the order of the Curie temperature, M_0 is the saturation magnetic moment, β the anisotropic constant, H_0 the constant outer magnetic field, $\Theta_{\vec{k}}$ and

$\varphi_{\vec{k}}$ are the polar angles of $\vec{k}$. Ψ and Φ are given by

$$\left.\begin{array}{l}\Psi(1,2;3,4) = -\mu(4M_0)^{-1}\theta_c a^2(k_1k_3 + k_2k_4)\\ |\Psi_2| \ll |\Psi_1| \ll |\Psi|\end{array}\right\} \text{при } 1 \gg ak \gg \sqrt{\frac{\mu M_0}{\theta_c}} \quad (20)$$

$$\Phi(1,2;3) = -\pi\mu\sqrt{2\mu M_0}\,(\sin 2\theta_1(e^{-i\varphi_1}u_1^* + e^{i\varphi_1}v_1^*)(u_2^*u_3 + v_2^*v_3) + \sin 2\theta_2(e^{-i\varphi_2}u_2^* + e^{i\varphi_2}v_2^*)(u_1^*u_3 + v_1^*v_3) + \sin 2\theta_3(e^{i\varphi_3}u_3 + e^{-i\varphi_3}v_3)(v_1^*u_2^* + v_2^*u_1^*)), \quad (21)$$

$$\left.\begin{array}{l}|\Phi_1| \sim |\Phi|; \quad |\Psi_1| \sim |\Psi_2| \sim |\Psi|\\ \Psi(1,2;3,4) = -{}^{3}/_{2}\,\mu^2\beta\,(u_1^*u_2^*u_3u_4 + 4u_1^*v_2^*v_3u_4 + v_1^*v_2^*v_3v_4)\end{array}\right\} \text{при } ak \ll \sqrt{\frac{\mu M_0}{\theta_c}}; \quad (22)$$

где [8])

$$u_k = \sqrt{(A_k + \varepsilon_k)/2\varepsilon_k}, \quad v_k = -e^{2i\varphi_k}\sqrt{(A_k - \varepsilon_k)/2\varepsilon_k}.$$

One obtains:

$$\chi_{xx}(k,\omega) = \tfrac{1}{2}\mu M_0 U_1(k)\{[\varepsilon_k - \omega - i\gamma(k)]^{-1} + [\varepsilon_k + \omega + i\gamma(k)]^{-1}\},$$
$$\chi_{yy}(k,\omega) = \tfrac{1}{2}\mu M_0 U_2(k)\{[\varepsilon_k - \omega - i\gamma(k)]^{-1} + [\varepsilon_k + \omega + i\gamma(k)]^{-1}\}, \quad (31)$$
$$\chi_{xy}(k,\omega) = -\tfrac{1}{2}i\mu M_0\{U(k)[\varepsilon_k - \omega - i\gamma(k)]^{-1} - U^*(k)[\varepsilon_k + \omega + i\gamma(k)]^{-1}\},$$
$$\chi_{yx}(k,\omega) = \tfrac{1}{2}i\mu M_0\{U^*(k)[\varepsilon_k - \omega - i\gamma(k)]^{-1} - U(k)[\varepsilon_k + \omega + i\gamma(k)]^{-1}\};$$

$$U_1(k) = |u_k|^2 + |v_k|^2 + u_k^*v_k + u_kv_k^*,$$
$$U_2(k) = |u_k|^2 + |v_k|^2 - u_k^*v_k - u_kv_k^*, \quad (32)$$
$$U(k) = 1 + u_k^*v_k - u_kv_k^*.$$

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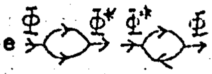
Theory of high-frequency magnetic... S/056/61/040/001/034/037
B102/B212

with $\gamma(\vec{k}) = \mathrm{Im}\Sigma(\vec{k}, -i\varepsilon_{\vec{k}}+0)$. The relaxation of the transverse magnetic moment is then investigated, and using the relation mentioned above, the resonance line width $\gamma(\vec{k})$ is determined. Diagrams of the type  are expressed in second perturbation theory approximation by

$$\mathrm{Im}\,\Sigma_\Phi(k, -i\omega+0) = (2\pi)^{-2}\int dk'\,|\Phi(k', k-k'; k)|^2\,[(n_{k'}+1)(n_{k-k'}+1) - n_{k'}n_{k-k'}]\,\delta(\omega-\varepsilon_{k'}-\varepsilon_{k-k'}) + 2(2\pi)^{-2}\int dk'\,|\Phi(k, k'; k+k')|^2\,[n_{k'}(n_{k+k'}+1) - (n_{k'}+1)\,n_{k+k'}]\,\delta(\omega+\varepsilon_{k'}-\varepsilon_{k+k'}). \quad (37)$$

For graphs of the type as shown in Figs. 4-5 formula (40) holds. Finally, the resonance line shape is investigated; here it is necessary to know $\gamma(0) = \mathrm{Im}\Sigma(0, -i\varepsilon_0+0)$; ε_0 denotes the frequency of the homogeneous resonance which is a function of the shape of the body: $\varepsilon_0 = \mu(H_0+\beta M_0)^{1/2}(H_0+\beta M_0+4\pi M_0)^{1/2}$. For two limiting cases

$$\gamma(0) = \begin{cases} \frac{2}{5\pi}\left(\frac{3}{8}\right)^{1/2}\mathrm{cth}\frac{\varepsilon_0}{4T}\left(\frac{\mu M_0}{\Theta_c}\right)^{5/2}\left(\frac{4\pi}{3}-\frac{H_0}{M_0}-\beta\right)^{5/2}\mu M_0, & \frac{4\pi}{3}-\frac{H_0}{M_0}-\beta \ll 1 \\ A\,\mathrm{cth}\frac{\varepsilon_0}{4T}\left(\frac{\mu M_0}{\Theta_c}\right)^{5/2}\left(\frac{H_0}{M_0}+\beta\right)^{1/2}\mu M_0, & \frac{H_0}{M_0}+\beta \ll 1 \end{cases} \quad (43)$$

$$A = \frac{\pi}{4}\int_0^{\pi/6}\cos^2\theta\sqrt{1-4\sin^2\theta}\,d\theta.$$

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Theory of high-frequency magnetic...

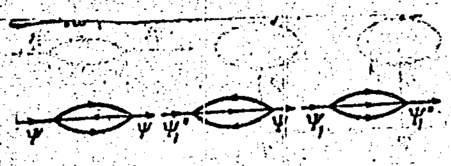

Fig. 4

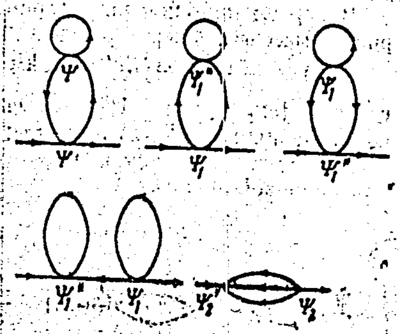

Fig. 5

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holds, and $\gamma(\vec{k})$ is given by

$$\gamma(k) = \mathrm{Im}\,\Sigma_{\Psi}(k, -i\varepsilon_k + 0) = \frac{1}{4(2\pi^6)}\left(\frac{\mu\Theta_c}{M_0}\right)^2\left(\exp\frac{\varepsilon_k}{T} - 1\right) a^6 \int dk'\,dk''\,(kk' + kk'' + k'k'' - k''^2)^2 (n_{k'} + 1)\, n_{k''} n_{k+k'-k''}\, \delta(\varepsilon_k + \varepsilon_{k'} - \varepsilon_{k''} - \varepsilon_{k+k'-k''}). \qquad (46)$$

For $\varepsilon_{\vec{k}} \sim T$ the following is valid $\gamma(\vec{k}) \approx (T/\Theta_c)^4 \Theta_c$. Finally the authors thank A. I. Akhiyezer for suggestions. M. I. Kaganov and V. M. Tsukernik are mentioned. There are 5 figures and 12 references: 8 Soviet-bloc and 4 non-Soviet-bloc.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk Ukrainskoy SSR (Institute of Physics and Technology, Academy of Sciences Ukrainskaya SSR)

SUBMITTED: July 18, 1960

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001239910004-2"

AKHIYEZER, I.A.; BAR'YAKHTAR, V.G.; PELETMINSKIY, S.V.

Theory of high frequency magnetic susceptibility of ferrodielectrics at low temperatures. Zhur. eksp. i teor. fiz. 49 no.1:365-374 Ja '61. (MIRA 14:6)

1. Fiziko-tekhnicheskiy institut AN Ukrainskoy SSR.
(Dielelectrics—Magnetic properties)

9.9845
24.6716
24.2120

34649
S/056/62/042/002/037/055
B108/B104

AUTHORS: Akhiyezer, A. I., Aleksin, V. F., Bar'yakhtar, V. G., Peletminskiy, S. V.

TITLE: Influence of radiative effects on relaxation of electrons and electric conductivity of a plasma in a strong magnetic field

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42, no. 2, 1962, 552 - 564

TEXT: This paper is to show that emission and absorption of electromagnetic waves by plasma electrons may have a considerable effect on the establishment of the thermal equilibrium of the electrons. Equilibrium of the absolute magnitude of the transverse electron momentum can be reached at nonrelativistic temperatures ($T \ll m_0c^2$) and of the transverse as well as of the longitudinal components of the electron momentum at relativistic temperatures ($T \gtrsim m_0c^2$). The radiative relaxation time has the order of magnitude of the ratio of mean electron energy to mean intensity of electron emission in a magnetic field. If this relaxation time is less than the mean time
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S/056/62/042/002/037/055
B108/B104

Influence of radiative ...

between two Coulomb collisions then it will also determine relaxation with respect to the corresponding variable. This means it will determine the time of equilibrium distribution of the electrons with respect to their absolute transverse momentum in the nonrelativistic case. The radiative relaxation time is of the order of unity at $H = 2 \cdot 10^5$ gauss, $T = 10^{-2} m_0c^2$, and an electron density of 10^3 cm^{-3}, and it decreases with increasing H and T and with decreasing electron density. The transverse component of the electric conductivity of a plasma is determined by the Coulomb collisions as well as by radiative effects. The longitudinal component on the other hand is determined by the Coulomb collisions only. Owing to this fact, electric conductivity of a plasma may be highly anisotropic. Beside the electron relaxation, also a relaxation of the photons occurs which manifests itself in a quasi-equilibrium distribution of the photons. This distribution which is determined by the instantaneous electron distribution reaches equilibrium, i. e., Rayleigh-Jeans distribution somewhat after electron relaxation. L. D. Landau, M. A. Leontovich, and K. N. Stepanov are thanked for discussions. Mention is made of B. A. Trubnikov, A. Ye. Bazhanova (Sb. Fizika plazmy i problema upravlyayemykh termoyadernykh reaktsiy (Plasma

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Influence of radiative ...

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B108/B104

physics and problems of controlled thermonuclear reactions), 3, Izd. AN SSSR, p. 121), V. S. Kudryavtsev. (idem, p. 114) and L. E. Gurevich. S. T. Pavlov (ZhTФ, 30, 41, 1960). There are 7 Soviet references.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk Ukrainskoy SSR (Physicotechnical Institute of the Academy of Sciences of the Ukrainskaya SSR)

SUBMITTED: August 21, 1961

Card 3/3

AKHIYEZER, A.I.; BAR'YAKHTAR, V.G.; PELETMINSKIY, S.V.

Effect of radiation processes on transport phenomena in a plasma in a high magnetic field. Zhur. eksp. i teor. fiz. 43 no.5:1743-1749 N '62. (MIRA 15:12)

1. Khar'kovskiy gosudarstvennyy universitet.
(Plasma (Ionized gases))
(Magnetic fields)

PELETMINSKIY, S.V.

Passage through matter of particles with dipole moments. Izv. vys. ucheb. zav.; radiofiz. 6 no.5:910-917 '63. (MIRA 16:12)

1. Fiziko-tekhnicheskiy institut AN UkrSSR.

BAR'YAKHTAR, V.G.; PELETMINSKIY, S.V.

Kinetic equations for plasma electrons and the photons radiated by them in a high magnetic field. Izv.vys.ucheb.zav.; radiofiz. 6 no.6:1115-1128 '63. (MIRA 17:4)

1. Fiziko-tekhnicheskiy institut AN UkrSSR.

ACCESSION NR: AP4017033 S/0141/63/006/006/1115/1128

AUTHORS: Bar'yakhtar, V. G.; Peletminskiy, S. V.

TITLE: Kinetic equations for plasma electrons and the photons radiated by them in a strong magnetic field

SOURCE: IVUZ. Radiofizika, v. 6, no. 6, 1963, 1115-1128

TOPIC TAGS: kinetic equations, transport equations, plasma, plasma in magnetic field, plasma electrons, plasma electron photons, electron photon correlation, perturbation theory, second order perturbation theory, absorption in plasma, radiation from plasma, radiation collision integral, transport phenomena

ABSTRACT: Kinetic equations, with allowance for the absorption and radiation, are derived for the electrons of a plasma situated in a strong magnetic field from the system of equations for the electron and photon correlation functions. In particular, the radiation col-

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ACCESSION NR: AP4017033

lision integrals for an inhomogeneous plasma, which are essential for investigation of transport phenomena, are derived and the currents in the inhomogeneous plasma determined. The electron and photon correlations in second approximation of perturbation theory are neglected, as are the effects connected with plasma polarization. "The authors express deep gratitude to A. I. Akhiyezer for a discussion of the obtained results." Orig. art. has: 37 formulas.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN UkrSSR (Physicotechnical Institute, AN UkrSSR)

SUBMITTED: 01Feb63 DATE ACQ: 18Mar64 ENCL: 00

SUB CODE: PH NO REF SOV: 003 OTHER: 002

Card 2/2

PELETMINSKIY, S.V.

Relaxation of photons and plasma electrons interacting with them in a high magnetic field. Zhur. Eksp. i teor. fiz. 44 no.2:735-743 F '63. (MIRA 16:7)

1. Fiziko-tekhnicheskiy institut AN UkrSSR.

PELETMINSKIY, S.V.

On the theory of singularities in nonlinear electrodynamics. Zhur. eksp. i teor. fiz. 44 no.3:1023-1035 Mr '63. (MIRA 16:3)
(Electrodynamics) (Electromagnetic fields)

L 11279-63 EWT(1)/BDS/EEC(b)-2 AFFTC/ASD Pi-4 GG/IJP(C)

ACCESSION NR: AP3005289 S/0056/63/045/002/0337/0343

AUTHOR: Akhiyezer, A. I.; Bar'yakhtar, V. G.; Peletminskiy, S. V. 61 60

TITLE: On coherent amplification of spin waves

SOURCE: Zhur. eksper. i teoret. fiz., v. 45, no. 2, 1963, 337-343

TOPIC TAGS: spin wave, coherent amplification, spin-wave amplification, coherent spin wave, ferromagnetic spin wave, antiferromagnetic spin wave

ABSTRACT: The amplification of spin waves in ferromagnetic (I) and antiferromagnetic (II) samples was investigated analytically by using the principles of coherent interaction between the spin waves and charged particles (electrons) produced by external sources or by an electric field applied to the samples. Linear Maxwell equations for the Fourier components of the electric and magnetic field intensities were set up and, with certain simplifying assumptions, solved for the case of charged particle-spin wave interactions. The solutions were applied to samples of types (I) and (II). It was found that the amplification is quite satisfactory when the conditions $\omega_s(k) = kv$ and $\omega_s(k) = kv - \omega_B$ are

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L 14279-63

ACCESSION NR: AP3005289

fulfilled, where ω_s (k) is the frequency of a spin wave of wave vector k, v is the particle velocity, and ω_B is the electron cyclotron frequency. At small particle densities and sufficient energy uniformity of the particles in the beam, the rate of growth is proportional to $n^{1/3}$ for ω_s = kv and to $n^{1/2}$ for ω_s = kv - ω_B. Orig. art. has: 20 formulas.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN Ukrainskoy SSR (Physicotechnical Institute, AN Ukrainian SSR)

SUBMITTED: 11Feb63 DATE ACQ: 06Sep63 ENCL: 00

SUB CODE: PH NO REF SOV: 005 OTHER: 001

Card 2/2

PELETMINSKIY, S.V.; YATSENKO, A.A.

Structure and motion of singularities in nonlinear electrodynamics.
Zhur. eksp. i teor. fiz. 45 no.5:1625-1633 N '63. (MIRA 17:1)

ACCESSION NR: AP4011759 S/0181/64/006/001/0219/0227

AUTHORS: Peletminskiy, S. V.; Bar'yakhtar, V. G.

TITLE: Theory of high frequency susceptibility of uniaxial ferromagnetics

SOURCE: Fizika tverdogo tela, v. 6, no. 1, 1964, 219-227

TOPIC TAGS: susceptibility, magnetic susceptibility, high frequency susceptibility, ferromagnetic, uniaxial ferromagnetic, ferromagnetic resonance, spin wave, magnetic anisotropy, spin wave interaction, Breit line

ABSTRACT: The authors have examined the form and width of the lines of homogeneous ferromagnetic resonance in uniaxial ferromagnetics in the field of low temperatures. To compute the magnetic susceptibility they used the formalism of spin waves as developed by F. Dyson (Phys. Rev., 102, 1217, 1230, 1956). In the case of homogeneous precession, the width of the line of ferromagnetic resonance is associated only with interaction between spin waves resulting from magnetic anisotropy. When the temperature of a body is much greater than the frequency of ferromagnetic resonance, but considerably less than the Curie point, and when the spin is sufficiently large, the line of ferromagnetic resonance has a Breit form and the

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ACCESSION NR: AP4011759

width of the line is proportional to T^2 (which is in agreement with the results of I. A. Akhiyezer, V. G. Var'yakhtar, and S. V. Peletminskiy. ZhETF, 40, 365, 1961). When the temperature of the body is much lower than the frequency of ferromagnetic resonance, the line is very asymmetrical relative to the resonance frequency, and the width of the line is exponentially small. In this field of very low temperature, computations are made without the normal assumption that the atomic spin is large (that is, much larger than one). "The authors thank A. I. Akhiyezer and I. A. Akhiyezer for their discussions of the work." Orig. art. has: 4 figures and 33 formulas.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN UkrSSR, Khar'kov(Physical and Technical Institute AN UkrSSR)

SUBMITTED: 24Jul63 DATE ACQ: 14Feb64 ENCL: 00

SUB CODE: PH NO REF SOV: 008 OTHER: 003

Card 2/2

L 40286-65 EWT(1)/EWT(m)/T/EWP(t)/EWP(b)/EWA(c) IJP(c) JD
ACCESSION NR: AP5004394 S/0056/65/048/001/0187/0203

AUTHORS: Bar'yakhtar, V. G.; Peletminskiy, S. V.

TITLE: Contribution to the theory of thermomagnetic phenomena in metals in a strong magnetic field

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 48, no. 1, 1965, 187-203

TOPIC TAGS: thermomagnetic phenomenon, kinetic coefficient, galvanomagnetic coefficient, thermomagnetic coefficient

ABSTRACT: The paper is devoted to a derivation of general formulas for the kinetic coefficients in the presence of an electric field and in the presence of gradients of the chemical potential and the temperature T. With the aid of these formulas the authors calculate the galvanomagnetic and thermomagnetic coefficients due to the scattering of electrons by a short-range potential. All the kinetic coef-

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ACCESSION NR: AP5004394

ficients are determined, for both degenerate and nondegenerate electron gas, for the case when the Larmor frequency of the electron is much larger than the temperature. It is shown that in the case of resonance, when the chemical potential is equal to $\zeta = \omega_H(N + 1/2)$ (ζ -- chemical potential, ω_H -- Larmor frequency of the electron, N -- positive integer), can reach a value on the order of unity. "The authors thank A. I. Akhiyezer, L. E. Gurevich, and A. L. Efros for a discussion of the work." Orig. art. has: 49 formulas.

ASSOCIATION: None

SUBMITTED: 24Jun64 ENCL: 00 SUB CODE: ME

NR REF SOV: 005 OTHER: 002

Card 2/2

YATSENKO, A.A.; PELETMINSKIY, S.V. [Peletmins'kyi, S.V.]

The classical theory of singularity in nonlinear field theory. Ukr. fiz. zhur. 9 no.6:581-592 Je '64. (MIRA 17:11)

1. Fiziko-tekhnicheskiy institut AN UkrSSR, Khar'kov.

PELETMINSKIY, S.V.

Electron and phonon relaxation in semimetals. Fiz. tver. tela 7 no.9:2660-2665 S '65.

Off-diagonal kinetic coefficients of conductors in a magnetic field. Ibid.:2666-2672

(MIRA 18:10)

PELETMINSKIY, S.V.

Theory of the longitudinal phenomena of transfer in metals in strong magnetic fields. Fiz.-met. i metalloved. 20 no.5:777-780 N '65. (MIRA 18:12)

1. Submitted March 12, 1965.

ACC NR: AP7002956 (A, N) SOURCE CODE: UR/0413/66/000/024/0005/0005

INVENTOR: Akhiyezer, A. I.; Peletminskiy, S. V.; Ber'yakhtar, V. G.

ORG: none

TITLE: Certificate of discovery. Class 00, No. 46

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 24, 1966, 5

TOPIC TAGS: supersonic wave, magnetic wave, magnetoacoustic resonance, ferromagnetic material, antiferromagnetic material

ABSTRACT:
This Certificate registers the discovery of an interaction between supersonic and magnetic (spin frequency) waves in ferro-, ferri-, and antiferromagnetic materials, which are especially strongly exhibited as the excitation of magnetic waves by supersonic waves and supersonic waves by magnetic waves when the frequencies of their vibration coincide (magneto-acoustic resonance). [TD]

SUB CODE: 20/ SUBM DATE: 08Jan65/ ATD PRESS: 5115

Card 1/1 UDC: none

ACC NR: AP6033555 SOURCE CODE: UR/0181/66/008/010/2951/2957

AUTHOR: Peletminskiy, S. V.; Petrov, E. G.

ORG: none

TITLE: Influence of thermal conductivity on high-frequency properties of ferromagnets

SOURCE: Fizika tverdogo tela, v. 8, no. 10, 1966, 2951-2957

TOPIC TAGS: thermal conduction, ferromagnetic material, uniaxial crystal, magnetic moment, magnetic susceptibility, entropy, spin wave, relaxation process, magnetic anisotropy, electric property

ABSTRACT: The influence of thermal conductivity on a uniaxial ferromagnet is calculated by determining the time variation of the energy of the ferromagnet, regarded as a function of the entropy density, the magnetic-moment density, and the derivative of the latter with respect to the coordinates. The external magnetic field is assumed perpendicular to the anisotropy axis, since a parallel orientation of the two makes the oscillations of the magnetic moment independent of the temperature. An equation is derived for the thermal conductivity in the presence of small deviations of the magnetic moment from equilibrium. The influence of the thermal conductivity on the tensor of the high-frequency magnetic susceptibility is then calculated, followed by an evaluation of the influence of the thermal conductivity on the damping of the spin waves. A numerical estimate shows that the damping due to the thermal conductivity may turn out to be not small compared with the damping due to other relaxation pro-

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ACC NR: AP6033555

cesses. Orig. art. has: 27 formulas.

SUB CODE: 20/ SUBM DATE: 28Feb66/ ORIG REF: 004/ OTH REF: 001

Card 2/2

L 18437-66 EWT(1)/EWP(m)/EWP(e)/T IJP(c)

ACC NR: AP6007792 SOURCE CODE: UR/0185/66/011/002/0124/0132

AUTHOR: Peletmins'kyy, S. V.—Peletminskiy, S. V.; Petrov, Ye. G.—Petrov, E. G.; Yatsenko, O. O.—Yatsenko, A. A.

ORG: Physical and Technical Institute AN URSR, Kharkov (Fizyko-tekhnichnyy instytut AN URSR)

21, 44, 55

40

B

TITLE: On motion equations of singularities

SOURCE: Ukrayins'kyy fizychnyy zhurnal, v. 11, no. 2, 1966, 124-132

TOPIC TAGS: motion equation, gravitation field, unified field theory, relativity principle, Lorentz transformation

ABSTRACT: The structure of singluarities of a gravitational field in the presence of an external gravitational field was investigated. Motion equations of the singularities are obtained as conditions of the solvability of the field equations. An extended dynamic Lorentz principle, necessary for finding motion equations of singularities in nonlinear field theory, is derived as the condition of solvability of the equations of a weak gravitational field. Orig. art. has: 22 formulas. [Based on author's abstract.] 21, 44, 55

SUB CODE: 20/ SUBM DATE: 18May65/ ORIG REF: 003/ OTH REF: 001/

Card 1/1 mc

2

PELETMINSKIY, S.V.; BAR'YAKHTAR, V.G.

Role of surface currents in transfer phenomena in a magnetic field. Fiz. tver. tela 7 no.2:446-450 F '65. (MIRA 18:8)

L 00728-66 EWT(1)/EPA(w)-2/EWA(m)-2 IJP(c) AT

ACCESSION NR: AP5022701 UR/0181/65/007/009/2660/2665

44,55

AUTHOR: Peletminskiy, S. V.

21,44,55

TITLE: Relaxation of electrons and phonons in semimetals

SOURCE: Fizika tverdogo tela, v. 7, no. 9, 1965, 2660-2665

TOPIC TAGS: relaxation process, electron, phonon, semiconductor theory

ABSTRACT: The author examines relaxation of the electron and phonon gases in semimetals in the temperature range where $T_0 \ll T \ll \Theta$. Here Θ is the Debye temperature, and $T_0 = 2p_0 s$ (p_0 is the limiting Fermi momentum and s is the speed of sound). Since energy transfer from phonons to electrons in this range is strongly limited by the law of conservation of energy and momentum, the kinetic equation for the electron distribution function is a Fokker-Planck equation. It is shown that a perturbation of the electron distribution function in the region where $\varepsilon < \zeta$ (ζ is the chemical potential) is propagated toward the increasing energy side, is deformed in a definite manner and reaches the limiting Fermi energy in a finite time. A perturbation in the energy region where $\varepsilon < \zeta$ behaves in a similar fashion, except that in this case it is shifted toward the lower energy side until the limiting Fermi energy is reached. If the number of phonons of some frequency ω_0 is greater

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L 00728-66

ACCESSION NR: AP5022701

at the initial instant than the equilibrium number of phonons for this frequency, then the electron distribution function satisfies the equation of diffusion with respect to the energy variable and time with a coefficient of diffusion which is independent of time. "The author is grateful to A. I. Akhiyezer and V. G. Bar'yakhtar for discussing the results of the work." Orig. art. has: 20 formulas.

ASSOCIATION: none

SUBMITTED: 09Mar65 ENCL: 00 SUB CODE: NP

NO REF SOV: 000 OTHER: 001

Card 2/2

L 00729-66 EWT(1) IJP(c)

ACCESSION NR: AP5022702 UR/0181/65/007/009/2666/2672

AUTHOR: Peletminskiy, S. V.

TITLE: Off-diagonal kinetic coefficients of conductors in a magnetic field

SOURCE: Fizika tverdogo tela, v. 7, no. 9, 1965, 2666-2672

TOPIC TAGS: magnetic field, electric conductor, surface boundary layer, surface property

ABSTRACT: Several authors have recently examined the problem of off-diagonal kinetic coefficients of conductors in the presence of a magnetic field. It has been shown that when calculating the full flows of charge and energy through the cross section of a conductor, it is necessary to consider surface currents which flow along the boundary of the specimen. These currents are concentrated close to the surface in a layer with a thickness of the order of the Larmor radius of the electron r_H. As distinct from kinetic coefficients which define the charge and energy flows by volume, the kinetic coefficients which define the complete flows satisfy both Onsager's symmetry relationships and Einstein's formulas. Calculations have been made only in the approximation $\omega_H \tau \gg 1$, where ω_H is the Larmor frequency of

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L 00729-66

ACCESSION NR: AP5022702

0

the electron and τ is the mean free time of the electron in the absence of a magnetic field. The authors derive formulas for kinetic coefficients which define full flows of charge and energy in the general case without limitations by strong magnetic fields or weak interactions. Orig. art. has: 22 formulas.

ASSOCIATION: none

SUBMITTED: 09Mar65 ENCL: 00 SUB CODE: NP, EM

NO REF SOV: 004 OTHER: 000

Card 2/2

ACCESSION NR: AP4040927 S/0185/64/009/006/0581/0592

AUTHOR: Yatsenko, A. A., Peletminsky*y, S. V. (Peletminskiy, S. V.)

TITLE: The classical theory of singularities in nonlinear field theory

SOURCE: Ukrayins'ky*y fizy*chny*y zhurnal, v. 9, no. 6, 1964, 581-592

TOPIC TAGS: Nonlinear electrodynamics, nonlinear field theory, classical singularity, electrodynamic field singularity, "four-trajectory," classical charge radius, singularity motion, radiation damping

ABSTRACT: The structures and motion of zero-mass singularities in a scalar field were studied according to nonlinear electrodynamic field theory. It was assumed that the radius of curvature of the "four-trajectory" was large compared to the "classical radius" of the singularity. On the basis of the electrodynamic principles of Lorentz, the equations of motion of the singularities were obtained, including the forces of radiation damping. The question of self-excitation of the charge with uniform motion was treated. Orig. art. has 32 numbered equations.

ASSOCIATION: Fiziko-tekhnichny*y insty*tut AN UkrSSR, Kharkov (Physico-Technical Institute AN UkrSSR)

Card 1/2

L 38536-65 EWT(1) IJP(c) S/0181/65/007/002/0446/0450

ACCESSION NR: AP5005280

AUTHOR: Peletminskiy, S. V.; Bar'yakhtar, V. G.

TITLE: On the role of surface current in transport phenomena in a magnetic field

SOURCE: Fizika tverdogo tela, v. 7, no. 2, 1965, 446-450

TOPIC TAGS: surface current, transport phenomenon, distribution function, kinetic coefficient, electric conductivity tensor, thermal conductivity tensor

ABSTRACT: The authors calculate the surface electric current and the surface energy flux in a conductor situated in a magnetic field, when there is no collision between charges and when the distribution function has an arbitrary dependence on the electron energy. An expression is derived for the kinetic coefficients with allowance for quantum corrections in the case when $1/\tau \ll \omega_H \ll T$ (τ -- mean free time of the electron and $\omega_H = eH/m$ -- Larmor frequency of the electron). It is shown that in this limiting case, when account is taken of the quantum corrections, the Wiedemann-Franz law holds for the nondiagonal components of the conductivity tensors and the thermal conductivity tensors. Allowance for the surface currents

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L 38526-65

ACCESSION NR: AP5000280

2

contributes only to the nondiagonal components of the kinetic tensors. "The authors thank A. I. Akhiyezer for a discussion of the results and P. S. Zyryanov for a preprint of his paper." Orig. art. has: 15 formulas.

ASSOCIATION: None

SUBMITTED: 22Jul64 ENCL: 00 SUB CODE: SS, EM

NR REF SOV: 002 OTHER: 001

Card 2/2mb

BAR'YAKHTAR, V.G.; PELETMINSKIY, S.V.

Theory of thermomagnetic phenomena in metals in a strong magnetic field. Zhur. eksp. i teor. fiz. 48 no.1:187-203 Ja '65. (MIRA 18:4)

AKHIYEZER, A.I.; BAR'YAKHTAR, V.G.; PELETMINSKIY, S.V.

Theory of transfer phenomena in metals in strong magnetic fields.
Zhur. eksp. i teor. fiz. 48 no.1:204-221 Ja '65. (MIRA 18:4)

1. Fiziko-tekhnicheskiy institut AN UkrSSR.

PELETMINSKIY, S.V.

Theory of the phenomena of transport in semimetals. Fiz. met. i metalloved. 20 no.4:481-488 O '65. (MIRA 18:11)

PELETMINSKIY, V.N.

Operation of hydraulic conveyers. Sakh.prom. 34 no.6:31-34 Je '60. (MIRA 13:7)

1. Krasnoyaruzhskiy sakharnyy zavod.
(Sugar beets)

PELETMINSKIY, V.N.

Comments on a note of I.G. Chugunov. Sakh. prom. 33 no.11:78 N '59
(Sugar manufacture) (MIRA 13:3)

PELEMINSKIY, V.M.

Simple electrode for measuring pH. Sakh.prom.29 no.6:26-27 '55.
Sakh.prom. 29 no.6:26-27 '55. (MIRA 9:1)

1.Krasnoyarushskiy sakharnyy zavod.
(Hydrogen-ion concentration)(Sugar--Analysis and testing)(Electrodes)

PEIETMINSKIY, V.N.

Modernization of drain piping for clarified liquid from settling tanks and thickeners. Sakh. prom. 33 no.5:21-29 My '59. (MIRA 12:7)

1. Krasno-Yaruzhskiy sakharnyy zavod.
(Sugar industry--Equipment and supplies)

PRIETMINSKIY, V.N.

Modernizing diffusion battery operation. Sakh.prom.30 no.1:13 Ja '56. (MIRA 9:6)

1.Krasnoyarushskiy sakharnyy zavod.
(Sugar machinery)

PELETMINSKIY, V.N.

4
8

Modernization of diffusion battery operation. V. N. Peletminskii (Sugar Refinery, Krasnovarużlisk). *Sakharnaya Prom.* 30, No. 1, 13(1950).—It is recommended to (1) use cossettes of square section, (2) load the diffusion battery with cossettes and juice simultaneously, (3) automatically measure the juice, (4) return diffusion waters with addn. of 0.1% Ca(HSO_3)[illegible] on the wt. of beets, thus producing colorless diffusion juice. Ca bisulfite is prepd. by bubbling SO_2 through milk of lime of 5° Baumé.

V. E. Baikow

Chem. Sci. Engr.

RM

PELETMINSKIY, V.N.

Separating stones and sand from beets. Sakh.prom. 31 no.7:27-30 Jl '57. (MLRA 10:8)

1.Krasnoyaruzhskiy sakharnyy zavod.
(Sugar industry--Equipment and supplies)

PRLETMINSKIY, V.N.

Arrangement for the automatic control of the continuous flow of juice. Sakh.prom.29 no.7:17-20 '55. (MLRA 9:1)

1.Krasno-Yarushskiy sakharnyy zavod.
(Sugar industry--Equipment and supplies)

MOSKALENKO, S.I.; GABOVICH, M.S.; BACHINSKIY, Yu.V.; TOMILIN, A.V.; MEDVEDEV, P.M.; LOMANOVA, M.M.; GOLOVKOV, P.D.; GAYDUKOV, G.I.; ALEYNIKOV, V.V.; STEHIN, N.D.; MIRONOVA, V.V.; BELAVINTSEVA, Ye.S.; TSVETSINSKIY, S.V.; NECHEPURNYY, P.; KOBZAR', N.K.; ROZHNOVA, Ye.S.; PELETMINSKIY, V.N.; GORDEYCHUK, V.K.; SHMERIGO, V.F.; KISLYUK, N.

Fifty years in the sugar industry. Sakh.prom. 33 no.2:18 F '59. (MIRA 12:3)

(Shtepan, Georgii Viacheslavovich, 1888-)

PELETMINSKIY, V.N.

USSR

General shortcomings in theories of diffusion. V. N. Peletminskii (Krasnoyaruzhsk Sugar Refinery). *Sakhar. Prom.* 25, No. 8, 22-5(1951).—In developing the theory of diffusion the important fact of under or overloading and the percentage of damaged cells in the cossettes are overlooked. It is proven that ruptured cells may amount to 66%; the sugar is extd. by simple washing of the open cell. V. E. Baikow