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(VIRUSES)
(RESPIRATORY TRACT INFECTION in inch & child)

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Preparation of primary human amnion tissue cultures. Acta microb. hung. 7 no.3:307-311 '60.

1. Institute of Microbiology, University Medical School, Szeged.
(TISSUE CULTURE)
(AMNION)

MECS, I.; SZOLLOSY, E.; KUKAN, Eszter; BELADI, Ilona

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(POLIOMYELITIS epidemiol.)

SZOLLOSY, E.; BELADI, Ilona; KUKAN, Eszter; AGOSTON, Eva; JANOSSY, G.; MILE, Ibolya

Virus excretion and antibody response of children immunized with monovalent or trivalent live poliovirus vaccines. Acta paediat. acad. sci. Hung. 3 no.1:33-39 '62.

1. Institute of Micobiology (Director: Prof. G. Ivanovics), University Medical School, Szeged, and Public Health and Epidemiological Station (Head Physician: J. Vetro), Szeged.
(POLIOMYELITIS immunology) (POLIOMYELITIS VIRUSES)

HUNGARY

BELADI, Ilona, KAHAN, Agoston, KUKAN, Esther, MUCSI, Ilona, PAPAI, Ibolya; Institute of Microbiology (director: IVANOVICS, G.) and Department of Ophthalmology (director: KUKAN, F.), University Medical School, Szeged. [original language versions not given].

"Etiological Relationship of Adenovirus Type 8 to the Keratoconjunctivitis Epidemic in Szeged."

Budapest, Acta Microbiologica Academiae Scientiarum Hungaricae, Vol X, No 1, 1963, pages 59-63.

Abstract: [English article, authors' English summary modified] Twelve strains of adenovirus type 8 have been isolated from 52 selected, early cases of keratoconjunctivitis with pronounced symptoms, during an outbreak of epidemic in Szeged, which afflicted over 1500 persons. Among these cases, a four-fold or greater increase of neutralizing antibodies was found against the isolated agents in seven out of nine pairs of sera tested. A similar rise of antibodies was registered in twelve out of fifteen paired sera obtained from patients afflicted with the disease where attempts to isolate the virus were negative. All Western references.

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BELADI, Ilona; KAHAN, A.; KUKAN, Esther; MUCSI, Ilona; PAPAI, Ibolya

Aetiologic relationship of adenovirus type 8 to the epidemic of keratoconjunctivitis in Szeged. Acta microbiol. acad. sci. Hung. 10 no.1:59-63 '63.

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(KERATOCONJUNCTIVITIS)
(ADENOVIRUS INFECTIONS)

KUKAN, E.; BELADI, I.

Isolation of parainfluenza type 3 virus in HeLa cells. Acta virol. (Praha) [Eng.] 8 no.4:383 Jl '64.

1. Institute of Microbiology of the Medical University, Szeged, Hungary.

HUNGARY

[redacted], BELADI, Ilona, BAKAI, Marta, MUCSI, Ilona, KUKAN, Eszter; Medical University of Szeged, Institute of Microbiology (director: IVANOVICS, G.) (Szegedi Orvostudomanyi Egyetem, Mikrobiologiai Intezet).

"Study of the Effect of Flavonoids and Related Substances I. The Effect of Quercetin on Different Viruses."

Budapest, Acta Microbiologica Academiae Scientiarum Hungaricae, Vol XIII, No 2, 1966, pages 113-118.

Abstract: [English article, authors' English summary modified] The effect of quercetin on different viruses has been studied. Herpesvirus hominis, Herpesvirus suis, type 3 of the parainfluenza virus and the Sindbis virus were found to be sensitive to quercetin. The sensitivity of type 1 poliovirus was moderate while types 2 and 3 of the poliovirus and types 3 and 4 of the adenoviruses were completely resistant. Being active only against the extra-cellular virus, quercetin was considered to have a virucidal effect. The effect of morin on Herpes suis was identical with that of quercetin while rutin was almost completely ineffective. 3 Hungarian, 14 Western references. [Manuscript received 27 Oct 65.]

FOLDI, M., dr.; KUKAN, F., dr.; SZEGHY, G., dr.; GELLERT, A., dr.; KOZMA, M., dr.; POBERAI, M., dr.; ZOLTAN, O.T., dr.; VARGA, L., dr.

Anatomical, histological and experimental data on the fluid circulation of the eye. Orv. hetil. 103 no.38:1789-1792 23 S '62.

1. Szegedi Orvostudomanyi Egyetem, II. Belklinika, Szemklinika es Anatomiai Intezet.

(EYE) (EYE PROTEINS) (LYMPHATIC SYSTEM)

KUKANOV, Adol'f Alekseyevich

[Way to the heart; a reporter's notebook]Doroga k serdtsu; reportazh. Tallin, Estonskoe gos. izd-vo, 1962. 87 p. (MIRA 15:12)

(China--Description and travel)
(Europe, Western--Description and travel)

68026

9(3) 9.9000

SOV/155-58-6-28/36

AUTHOR: Kukanov, A.B. 21

TITLE: On the Question Concerning the Polarization of Electron Waves Under Reflection on a Plane Metallic Surface

PERIODICAL: Nauchnyye doklady vysshey shkoly. Fiziko-matematicheskiye nauki, 1958, Nr 6, pp 180-184 (USSR)

ABSTRACT: The author uses the data of Sokolov [Ref 1 - 4] on the reflection of electron waves on plane metallic surfaces and investigates the polarization phenomena taking place thereby. The state with negative energy is neglected as in [Ref 3]. Since in relativistic quantum mechanics the projection of the spin on an arbitrary direction is no integral of motion, it is described by the mean value.
The direction cosines of the spin vectors are calculated in the mean, and relations between the direction cosines of the spin vectors of the falling and of the reflected particles are obtained. The author states that the direction of the spin vector remains unaltered under reflection only if the spin vector of the falling particles lies in a certain plane. The author gives the condition under which the longitudinal

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On the Question Concerning the Polarization of Electron Waves Under Reflection on a Plane Metallic Surface SOV/155-58-6-28/36

polarization for reflection is transformed into a transverse polarization.

The author thanks A.A. Sokolov for the problem and discussion.

There are 5 references, 2 of which are Soviet, 2 American, and 1 Italian.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova (Moscow State University imeni M.V. Lomonosov)

SUBMITTED: November 20, 1958

Card 2/2

Kukanov A. B.

AUTHORS: Loskutov, Yu. M., Kukanov, A. B. 56-2-27/51

TITLE: On the Polarization of the Radiation Emitted by a "Super-light"-Magnetic Moment (O polyarizatsii izlucheniya "sverkhsvetovym" magnitnym momentom)

PERIODICAL: Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, 1958, Vol 34, Nr 2, pp 477-482 (USSR)

ABSTRACT: By means of the method of quantum electro-dynamics the authors investigate the problem of the polarization of the irradiation emitted by a "superlight" magnetic moment, which moves in a ferro-dielectric. Expressions are given for the intensity of radiation per unit length. The taking into account of the magnetic permeability of the medium does not change the character of the polarization of the radiation in the dielectric. The first chapter deals with the polarization of the radiation emitted by the magnetic moment. An expression is put down for the vector potential $\vec{A}$ of the quantized electromagnetic field in a medium with the characteristics $\varepsilon(\omega)$ and $\mu(\omega)$. The amplitude A of the vector potential is decomposed to components which characterize

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certain polarization states. Also for the operator of the interaction energy as well as for the probability of the radiation emitted by the magnetic moment expressions are put down. Then the intensity of the radiation per unit length is calculated by averaging over the spin states. An expression is also put down for the threshold radiation. The radiation is partly polarized and different from zero also at the threshold value. The latter circumstance is caused by the spin-flip and is a pure quantum effect. The polarized as well as the unpolarized part are of the same order of magnitude. The second chapter investigates the energy losses in motion in a ferro-dielectric. Here it is made a condition that the direction of the magnetic moment coincides with its direction of motion. The equations of the field potentials are put down in detail for this case. Finally the expressions for the energy losses are deduced and divided into Cherenkov- and ionization parts. There are 8 references, all of which are Slavic.

ASSOCIATION: **Moscow State University** (Moskovskiy gosudarstvennyy universitet)

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On the Polarization of the Radiation Emitted by a "Superlight"- 56-2-27/51
Magnetic Moment

SUBMITTED: August 21, 1957

AVAILABLE: Library of Congress

1. Dielectric radiation-Polarization 2. Mathematics-Theory

Card 3/3

KUKANOV, A.B.

Polarization of electron waves reflected from a plane metal surface.
Izv. vys. ucheb. zav.; fiz. no.4:3-12 '59. (MIRA 13:3)

1. Moskovskiy gosuuniversitet imeni M.B. Lomonosova.
(Electron optics)

KUKANOV, A.B.

Elastic scattering of electrons with oriented spin in the crystal lattice of a metal. Izv.vys.ucheb.zav.;fiz. no.2:10-20 '60. (MIRA 13:8)

1. Moskovskiy gosuniversitet im. M.V.Lomonosova.
(Electrons--Scattering) (Metal crystals)

KOROLEV, F.A.; KUKANOV, A.B.

Producing short (on the order of 3.10^{-7} sec.) light pulses by means of a spark discharge and an oscilloscope. Izv.vys.ucheb. zav.;fiz. no.2:44-47 '60. (MIRA 13:8)

1. Moskovskiy gosuniversitet im. M.V.Lomonosova.
(Electric discharge lighting)

88039

S/139/60/000/006/001/032
E032/E414

24,7500 (1035, 1145, 1160)

AUTHOR: Kukanov, A.B.

TITLE: On the Elastic Scattering of Electrons With Oriented Spins by the Crystal Lattice of a Metal

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika, 1960, No.6, pp.3-12

TEXT: The relativistic quantum mechanics is used to analyse the selective reflection of electron waves by crystalline metals (Wul'f-Bragg reflection). A relation is found between polarisations of the reflected and incident waves. A condition is derived which can be used to determine when the longitudinal polarisation of an electron beam can be transformed into a transverse polarisation with the aid of crystalline metal, and vice versa. The analysis is based on the following considerations. A cartesian set of coordinates is chosen so that the plane $z = 0$ corresponds to the surface of the metal and the metal itself occupies the region $z \geqslant 0$. The potential energy outside the metal is taken to be equal to zero and electrons incident on the

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metal from the side of the negative z axis are described by the wave function

Eq. (2)

$$\psi = \sum_s C_s \psi_s = L^{-3/2} \sum_s C_s b_s e^{-i\kappa K t + i k r} \quad (2)$$

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where

$$b_s = \frac{1}{\sqrt{2}} \begin{vmatrix} f(+K)\cos\theta_s e^{-\frac{i\varphi_H}{2}}, \\ f(+K)\sin\theta_s\, e^{\frac{i\varphi_H}{2}}, \\ sf(-K)\cos\theta_s e^{-\frac{i\varphi_H}{2}}, \\ sf(-K)\sin\theta_s e^{\frac{i\varphi_H}{2}}, \end{vmatrix} \qquad (3)$$

$$\theta_s = \frac{\theta}{2} + \frac{\pi}{4}\left(1 - s\right); \qquad f(\pm K) = \sqrt{1 \pm \frac{K_0}{K}} \qquad (4)$$

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On the Elastic Scattering of Electrons with Oriented Spins by the Crystal Lattice of a Metal

The wave function given by Eq. (2) is the simultaneous solution of the Dirac equation and the equation

$$\hat{S}\psi = \frac{(\sigma\nabla)}{ki}\psi = s\psi \qquad (5)$$

subject to the condition that the electron energy outside the metal is zero. It takes into account only those states which correspond to the positive energy. The lattice is assumed to be of simple cubic structure and the potential energy of the electron inside the metal is taken to be of the form

$$V(x, y, z) = -\vartheta + \overset{1}{V}(x, y, z); \qquad z > 0 \qquad (6)$$

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where $\overset{0}{V}$ is a constant positive parameter characteristic of each given metal, and

$\overset{1}{V}(x, y, z)$ is a small addition to $\overset{0}{V}$.

It is such that the spatial average of the potential energy inside the metal is equal to $-\overset{0}{V}$. The function $\overset{1}{V}$ is then expanded so that

$$\overset{1}{V}(x, y, z) = \overset{1}{V}(x + d, y + d, z + d) = \sum_{\ell, m} V_{\ell, m}(z)\, e^{-2\pi i/d(\ell x + my)} \quad (7)$$

where d is the lattice constant and

ℓ, m are integers.

The wave function for an electron inside the metal is taken to

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be of the form

$$\psi^{\nu} = e^{-icK^{\nu}t}\varphi^{\nu}(x,y,z) \qquad (8)\ .$$

The quantities φ^{ν} and K^{ν} are then expanded into the series

$$\varphi^{\nu} = \overset{0}{\varphi}{}^{\nu} = \overset{1}{\varphi}{}^{\nu} + \ldots, \qquad (9)$$

$$K^{\nu} = \overset{0}{K}{}^{\nu} + \overset{1}{K}{}^{\nu} + \ldots, \qquad (10)$$

where $\overset{1}{\varphi}{}^{\nu}$ and $\overset{1}{K}{}^{\nu}$ are of the same order of small quantities as V_1. The zero-order approximation is then given by

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$$\overset{0}{\varphi}{}' = e^{-ic\overset{0}{K}{}'\overset{0}{t}}\varphi'$$

which is a solution of the Dirac equation for the case $V(x,y,z) \equiv -\overset{0}{V}$. The author has obtained the following system of four linear equations for the function $\overset{1}{\varphi}{}'$:-

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$$\left[\Delta + (R^2 - \kappa_0^2)\right]\overset{1}{\varphi_1}{}' = \frac{1}{i}\frac{\partial}{\partial z}\Gamma_3 + (R + \kappa_0)\Gamma_1 + + \left(\frac{1}{i}\frac{\partial}{\partial x} - \frac{\partial}{\partial y}\right)\Gamma_4,$$

$$\left[\Delta + (R^2 - \kappa_0^2)\right]\overset{1}{\varphi_2}{}' = -\frac{1}{i}\frac{\partial}{\partial z}\Gamma_4 + (R + \kappa_0)\Gamma_2 + + \left(\frac{1}{i}\frac{\partial}{\partial x} + \frac{\partial}{\partial y}\right)\Gamma_3,$$

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$$\left[\Delta + (R^2 - \kappa_0^2)\right] \overset{1}{\varphi}_3{}' = -\frac{1}{i}\,\frac{\partial}{\partial z}\Gamma_1 + (R - \kappa_0)\Gamma_3 + \left(\frac{1}{i}\,\frac{\partial}{\partial x} - \frac{\partial}{\partial y}\right)\Gamma_2,$$

$$\left[\Delta + (R^2 - \kappa_0^2)\right] \overset{1}{\varphi}_4{}' = -\frac{1}{i}\,\frac{\partial}{\partial z}\Gamma_2 + (R - \kappa_0)\Gamma_4 + \left(\frac{1}{i}\,\frac{\partial}{\partial x} + \frac{\partial}{\partial y}\right)\Gamma_1. \qquad (11)$$

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where

$$R = \overset{0}{K'} + \frac{\overset{0}{2V\pi}}{hc} \qquad (12)$$

$$\Gamma_q = \left(\frac{\overset{1}{2V\pi}}{hc} - \overset{1}{K'}\right)\overset{0}{\varphi}_q{}' \quad (q = 1, 2, 3, 4) \qquad (13) .$$

In analysing the set of equations given by Eq. (11) one must distinguish between the case where the wave functions are degenerate with respect to momentum in the absence of perturbations ,from the case when there is no degeneracy. The present paper is concerned with the first of these two cases and the analysis is limited to the zero-order approximation. It was shown in Ref. 6 that the degeneracy

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sets in when

$$k_1'^2 + k_2'^2 + k_3'^2 = \left(k_1' - \frac{2\pi}{d}\ell\right)^2 + \left(k_2' - \frac{2\pi}{d}m\right)^2 + \left(k_3' - \frac{2\pi}{d}n\right)^2 \tag{14}$$

where n is an integer and

$k' = (k_1', k_2', k_3')$ is the momentum of the particle inside the metal when $V^1 \cong 0$.

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Eq. (14) is identical with the Wul'f-Bragg law. The analysis is then continued for the case where a selective (Bragg) reflection takes place from a system of plane nets parallel to the $z = 0$ plane and expressions are derived for the energy gap in the metal. The paper is concluded with a set of general expressions obtained from the above theory for the relations between the polarisations of incident and reflected waves.

Acknowledgments are expressed to Professor A.A. Sokolov for valuable advice. There are 20 references: 13 Soviet and 7 non-Soviet.

ASSOCIATION: Moskovskiy gosuniversitet imeni M.V. Lomonosova (Moscow State University imeni M.V. Lomonosov)

SUBMITTED: January 14, 1960

Card 12/12

KUKANOV, A. B.

Cand Phys-Math Sci - (diss) "Several problems related to the motion of point dipole moments and Dirac particles in matter." Minsk, 1961. 8 pp; (Belorussian State Univ imeni V. I. Lenin); 220 copies; price not given; bibliography at end of text (17 entries); (KL, 7-61 sup, 219)

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S/139/61/000/002/003/018
E032/E414

24.2500 (1140,1141,1482)

AUTHOR: Kukanov, A.B.

TITLE: On the Cherenkov Radiation Emitted by Magnetic and Electric Dipoles

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika, 1961, No.2, pp.28-33

TEXT: The Cherenkov radiation emitted by magnetic and electric dipoles has been discussed by many authors. Different workers are said to have obtained different formulae for the intensity of the radiation emitted by a magnetic dipole perpendicular to its direction of motion. V.L.Ginzburg and V.Ya.Eydman (Ref.13 and 16) have pointed out that some authors base their calculations on a model in which the magnetic moment is formed by a pair of magnetic poles, while other workers discuss the phenomenon in terms of magnetic moments associated with current loops. A "true" magnetic dipole is not in general equivalent to a current-loop magnetic moment of the same magnitude and direction. The present author discusses this conclusion using the method described by him and Yu.M.Loskutov in Ref.11. The Maxwell equations for a medium with complex ε and μ are taken in the form

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$$\begin{aligned} \operatorname{rot} H^e &= \frac{1}{c}\frac{\partial D^e}{\partial t} + \frac{4\pi}{c} j^e_{\text{ст}}, \\ \operatorname{rot} E^e &= -\frac{1}{c}\frac{\partial B^e}{\partial t}, \\ \operatorname{div} D^e &= 4\pi\rho^e_{\text{ст}}, \\ \operatorname{div} B^e &= 0. \end{aligned} \qquad (1)$$

It is assumed that the system of electric charges and currents is characterized in the laboratory system by magnetic and electric moments μ^e and π^e, and that the dimensions of the system are so small that it may be looked upon as a point system. In that case

$$\rho^e_{\text{ст}} = -\operatorname{div} P^e = -\operatorname{div}[\pi^e\delta(r - vt)] \qquad (2)$$

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$$j_{r} = c \operatorname{rot} M^{e} + \frac{\partial P^{e}}{\partial t} = c \operatorname{rot}[\mu^{e}\delta(r - vt)] + \frac{\partial}{\partial t}[\pi^{e}\delta(r - vt)]. \quad (3)$$

where v is the (constant) velocity of motion of the dipoles. In terms of the vector and scalar potentials, Eq.(1) leads to

$$\Delta A - \frac{\varepsilon\mu}{c^2}\frac{\partial^2 A}{\partial t^2} = -\frac{4\pi\mu}{c} j^{e}_{\text{ст}}, \quad (7)$$

$$\Delta\varphi - \frac{\varepsilon\mu}{c^2}\frac{\partial^2 \varphi}{\partial t^2} = -\frac{4\pi}{\varepsilon} \rho^{e}_{\text{ст}}. \quad (8)$$

so that in the case of uniform motion of the dipoles along the z-axis, the special solutions are

$$A = \frac{1}{\pi} \operatorname{rot} \left\{ \mu^{e} \int \mu K_0(\xi\rho) e^{ik_3(z-vt)} dk_3 \right\} +$$

$$+ \frac{1}{\pi c} \frac{\partial}{\partial t} \left\{ \pi^{e} \int \mu K_0(\xi\rho) e^{ik_3(z-vt)} dk_3 \right\}, \qquad (9)$$

$$\varphi = -\frac{1}{\pi} \operatorname{div} \left\{ \pi^{e} \int \frac{K_0(\xi\rho) e^{ik_3(z-vt)} dk_3}{\varepsilon} \right\}. \qquad (10)$$

where

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$$K_0(\xi\rho) = \frac{1}{2} \pi i H_0^{(1)}(i\xi\rho) -$$

$$\rho = (x^2 + y^2)^{1/2},$$

$$\xi = k_s(1-\beta^2\varepsilon\mu)^{1/2}\,\mathrm{sign}\,Re\,k_s(1-\beta^2\varepsilon\mu)^{1/2}, \qquad (11)$$

$$k_s = \frac{\omega}{v}; \qquad \beta = \frac{v}{c}; \qquad (12)$$

In order to determine the energy losses by collisions with impact parameters greater than b, one can use the Poynting theorem

$$W_b^c = \frac{c}{4\pi}\int_b \left[\,E^c\,H^c\,\right] dS, \qquad (13)$$

In the case of small impact parameters b

$$K_0(\xi b) = \frac{1}{2}\ln\frac{4}{3{,}17\xi^2 b^2}, \quad K_1(\xi b) = \frac{1}{\xi b}. \qquad (14)$$

The final expression for the Cherenkov part of the energy loss per unit path length is found to be (electric dipoles)

$$W^{e}_{\text{чер}} = \frac{\mu^{e2}_{0z_0}(1-\beta^2)}{v^4}\int_0^{\omega_{max}} \omega^3 |\beta^2 Re\varepsilon\, |\mu|^2 - Re\,\mu| d\omega +$$

$$+ \frac{\pi^{e2}_{0z_0}(1-\beta)^2}{v^4}\int_0^{\omega_{max}} \omega^3 |\beta^2 Re\mu - \frac{Re\varepsilon}{|\varepsilon|^2}| d\omega + \frac{\mu^{e2}_{0x_0} + \mu^{e2}_{0y_0}}{2v^4}\int_0^{\omega_{max}} \omega^3 \Big\{(1-\beta^2)^2 |Re\mu| +$$

$$+ \beta^2 \frac{|Re\varepsilon|}{|\varepsilon|^2}\Big[\Big(1 - Re\varepsilon\mu\Big)^2 + Im^2\varepsilon\mu\Big]\Big\} d\omega +$$

$$+ \frac{\pi^{e2}_{0x_0} + \pi^{e2}_{0y_0}}{2v^4}\int_0^{\omega_{max}} \omega^3 \frac{|Re\varepsilon|}{|\varepsilon|^2}\Big[\Big(1 - \beta^2 Re\varepsilon\mu\Big)^2 + \beta^4 Im^2\varepsilon\mu\Big] d\omega + \qquad (16)$$

$$+\frac{(\mu^{e}_{0x_0}\pi^{e}_{0y_0}-\mu^{e}_{0y_0}\pi^{e}_{0x_0})\beta}{v^4}\int_0^{\omega_{max}}\omega^3\frac{|Re\,\varepsilon|}{|\varepsilon|^2}\left[\left(1-\beta^2 Re\,\varepsilon\mu\right)\left(1-\right.\right.$$

$$\left.\left.-Re\,\varepsilon\mu\right)+\beta^2 Im^2\varepsilon\mu\right]d\omega \qquad (16)$$

where $\mu^e_o(\mu^e_{ox_o}, \mu^e_{oy_o}, \mu^e_{oz_o})$ and $\pi^e_o(\pi^e_{ox_o}, \pi^e_{oy_o}, \pi^e_{oz_o})$ are respectively the magnetic and electric moments for the rest system x_o, y_o, z_o. The first four terms in Eq.(16) are identical with the formulae given by V.L.Ginsburg (Ref.1) and I.M.Frank (Ref.2)

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000827230006-3"

for $\mu = 1$ and $\varepsilon = \mathrm{Re}\,\varepsilon > 0$. Next, consider a system of magnetic charges and currents whose centre of inertia moves through a medium with complex μ and ε with a constant velocity v along the z-axis. If the dimensions of the system, which in the laboratory frame has magnetic and electric moments μ^m and π^m, are sufficiently small, then the charge and current densities are given by

$$\rho^m_{\text{ст}} = -\operatorname{div} M^m = -\operatorname{div}\,[\mu^m \delta(r - vt)], \tag{18}$$

$$J^m_{\text{ст}} = -\operatorname{crot} P^m + \frac{\partial M^m}{\partial t} = -\operatorname{crot}\,[\pi^m \delta(r - vt)] + \frac{\partial}{\partial t}[\mu^m \delta(r - vt)]. \tag{19}$$

The electromagnetic field appearing in the medium is then described by the Maxwell equations

$$\left.\begin{aligned} \mathrm{rot}H^m &= \frac{1}{c}\frac{\partial D^m}{\partial t}, \\ \mathrm{rot}E^m &= -\frac{1}{c}\frac{\partial B^m}{\partial t} - \frac{4\pi}{c}j^m_{\text{от}}, \\ \mathrm{div}D^m &= 0, \\ \mathrm{div}B^m &= 4\pi\rho^m_{\text{ст}}. \end{aligned}\right\} \quad (20)$$

and the transition from Eq.(1) - (3) to Eq.(18) - (20) is obtained by the following replacement

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It follows that the intensity of Cherenkov radiation emitted per unit path (magnetic origin) is given by

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$$W^{m}_{\text{чер}} = \frac{\mu^{m^2}_{0z_0}(1-\beta^2)}{v^4}\int\limits_0^{\omega_{max}} \omega^3 \left| Re\,\varepsilon\,\beta^2 - \frac{Re\mu}{|\mu|^2}\right| d\omega +$$

$$+ \frac{\pi^{m^2}_{0z_0}(1-\beta^2)}{v^4}\int\limits_0^{\omega_{max}} \omega^3 \,|Re\mu|\varepsilon|^{-2}\beta^2 - Re\varepsilon| d\omega +$$

$$+ \frac{\mu^{m^2}_{0x_0} + \mu^{m^2}_{0y_0}}{2v^4}\int\limits_0^{\omega_{max}} \omega^3 \frac{|Re\mu|}{|\mu|^2}\left[(1-\beta^2 Re\varepsilon\mu)^2 + \right.$$

$$\left. + \beta^4 Im^2\varepsilon\mu\right] d\omega + \frac{\pi^{m^2}_{0x_0} + \pi^{m^2}_{0y_0}}{2v^4}\int\limits_0^{\omega_{max}} \omega^3 \left\{(1-\beta^2)^2|Re\varepsilon| + \right. \qquad (21)$$

$$\left. + \beta^2\frac{|Re\mu|}{|\mu|^2}\left[(1-Re\varepsilon\mu)^2 + Im^2\varepsilon\mu\right]\right\} d\omega + \frac{(\mu^{m}_{0x_0}\,\pi^{m}_{0y_0} - \mu^{m}_{0y_0}\,\pi^{m}_{0x_0})\beta}{v^4}\int\limits_0^{\omega_{max}} \omega^3 \frac{|Re\mu|}{|\mu|^2} \times$$

$$\times \left[(1-\beta^2 Re\varepsilon\mu)(1-Re\varepsilon\mu) + \beta^2 Im^2\varepsilon\mu\right] d\omega.$$

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where $\mu_0^m(\mu_{ox_0}^m, \mu_{oy_0}^m, \mu_{oz_0}^m)$ and $(\pi_0^m \pi_{ox_0}^m, \pi_{oy_0}^m, \pi_{oz_0}^m)$ are the magnetic and electric moments in the rest system, and are related to μ^m and π^m by

$$\left.\begin{aligned} \mu^e &= \mu_0^e - (1 - \sqrt{1-\beta^2})(\mu_0^e v_0) v_0 - \beta [v_0 \pi_0^e], \\ \pi^e &= \pi_0^e - (1 - \sqrt{1-\beta^2})(\pi_0^e v_0) v_0 + \beta [v_0 \mu_0^e], \end{aligned}\right\} \quad (17)$$

$$_0 = \frac{v}{v}.$$

The first and third terms in Eq.(21) are identical with Eq.(4.23) and (4.24) in Ref.4, with $\mu = 1$ and $\varepsilon = \mathrm{Re}\,\varepsilon > 0$.

Acknowledgments are expressed to Professor A.A.Sokolov for his interest in this work and to Professor A.N.Matveyev for discussing the results. There are 29 references: 26 Soviet and 3 non-Soviet.

21508

S/139/61/000/002/003/018
E032/E414

On the Cherenkov ...

ASSOCIATION: Moskovskiy gosuniversitet imeni M.V.Lomonosova (Moscow State University imeni M.V.Lomonosov)

SUBMITTED: June 20, 1960

Card 12/12

20769

24,2300 (1127, 1158, 1482)

S/051/61/010/003/001/010
E032/E514

AUTHOR: Kukanov, A. B.

TITLE: On the Quantum Theory of Vavilov-Cherenkov Radiation Emitted by a Magnetic Moment

PERIODICAL: Optika i spektroskopiya, 1961, Vol.10, No.3, pp.289-296

TEXT: The emission of Vavilov-Cherenkov radiation by a magnetic moment has been discussed by a number of workers on the basis of both classical and quantum theories. However, there are discrepancies between formulae obtained by different authors. V. L. Ginzburg and V. Ya. Eydman (Ref.11) showed that some authors (I. M. Frank, Ref.3; V. Ya. Eydman, Ref.7; N. L. Balazs, Ref.8) used a model of a magnetic moment in which the latter is formed by magnetic poles, while other workers consider magnetic moments associated with current loops. In the present paper the relativistic quantum electromechanics is used to investigate the emission of Vavilov-Cherenkov radiation by a neutral (e = 0) Dirac particle having an intrinsic magnetic moment μ_o. The analysis starts with the Dirac equation for a magnetic moment (A. A. Sokolov, Ref.19; A. I. Akhiyezer, V. B. Berestetskiy, Ref.20):

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On the Quantum Theory of ... S/051/61/010/003/001/010
E032/E514

$$-\frac{\hbar}{i}\frac{\partial}{\partial t}\psi=\left(\frac{c\hbar}{i}(\alpha\nabla)+\hat{U}+\rho_3 m_0 c^2\right)\psi. \quad (1)$$

In this equation m_o is the mass of the magnetic moment, α and ρ_3 are the Dirac matrices and $\hat{U}$ is the operator representing the energy of interaction between the magnetic moment and the electromagnetic field in the medium. It is assumed that the magnetic moment is moving through a transparent ferrodielectric whose dielectric constant and magnetic permeability are ε(ω) and μ(ω), respectively. Two possible forms of interaction between the magnetic moment and the electromagnetic field in the medium are considered. These correspond to the following two forms of the interaction energy operator

$$\hat{U}^{B,E}=-\mu_0\left[\rho_3(\sigma B)+\rho_2(\sigma E)\right] \quad (2)$$

$$\hat{U}^{H,D}=-\mu_0\left[\rho_3(\sigma H)+\rho_2(\sigma D)\right]. \quad (3)$$

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In the above two equations σ and ρ_2 are the Dirac matrices. The vector potential $\underline{A}$ for the quantized transverse electromagnetic field in the ferrodielectric is written down in the form (A. A. Sokolov and V. N. Tsytovich, Ref.21):

$$A = L^{-\frac{3}{2}} \sum_{\varkappa} \left(\frac{2\pi c'' \hbar}{\varkappa}\right)^{\frac{1}{2}} [a \exp(-ic'\varkappa t + i\varkappa r) + a^{+} \exp(ic'\varkappa t - i\varkappa r)], \qquad (4)$$

where L^3 is the volume of the basic parallelipiped,

$$c' = \frac{c}{n} = \frac{c}{\sqrt{\varepsilon\mu}}, \quad c'' = c'\mu$$

and $\hbar\varkappa$ is the momentum of the photon. The amplitudes a and a^+ obey the following relations

$$a_n a'^{+}_{n'} - a'^{+}_{n'} a_n = \delta_{\varkappa_1 \varkappa_1'} \delta_{\varkappa_2 \varkappa_2'} \delta_{\varkappa_3 \varkappa_3'} \left(\delta_{nn'} - \frac{\varkappa_n \varkappa_{n'}}{\varkappa^2}\right), \qquad (5)$$

$$n, n' = 1, 2, 3.$$

In particular, in the absence of photons at the initial instant (which is assumed throughout) one can write

$$\left.\begin{aligned} a^{\prime +}_{n'} a_n &= 0, \\ a_n a^{\prime +}_{n'} &= \delta_{\varkappa_1 \varkappa_1'} \delta_{\varkappa_2 \varkappa_2'} \delta_{\varkappa_3 \varkappa_3'} \left(\delta_{nn'} - \frac{\varkappa_n \varkappa_{n'}}{\varkappa^2}\right) \end{aligned}\right\}. \qquad (6)$$

This formalism is used to obtain a formula for the intensity of the radiation emitted in the case of linear polarization and circular polarization. It is shown that in the case of the μ_o;B,E interaction, the emission due to longitudinally polarized particles is, in general, elliptically polarized, whilst the radiation due to unpolarized particles consists of two parts, namely, the linearly polarized component and an additional unpolarized component. In the case of the μ_o;H,D interaction, the radiation emitted is always linearly polarized whatever the initial spin state and velocity. The formulae obtained are then specialized to the ultrarelativistic case ($\beta \rightarrow 1$). The special case cos $\Theta = 1$ is also discussed in

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On the Quantum Theory of ...

S/051/61/010/003/001/010
E032/E514

some detail. Acknowledgments are expressed to A. A. Sokolov for his interest in this work and to Yu. M. Loskutov for discussions. There are 28 references: 27 Soviet and 1 non-Soviet.

SUBMITTED: April 21, 1960

Card 5/5

24.6720

S/051/63/014/001/020/031
E032/E514

AUTHOR: Kukanov, A.B.

TITLE: A simple method of calculating Cherenkov losses in a transparent uniaxial crystal

PERIODICAL: Optika i spektroskopiya, v.14, no.1, 1963, 121-124

TEXT: A. G. Sitenko and A. A. Kolomenskiy (ZhETF, 30, 511, 1956) have obtained a general expression for the energy emitted by a point charge in an optically-active uniaxial dielectric in the form of a Fourier integral over the wave number and frequency space. The present paper reports a method of evaluating this integral over the wave number space in the case where the point charge moves through a transparent uniaxial ferrodielectric at an arbitrary angle to the optic axis. It is shown that the energy of the extraordinary waves is given by

$$W_\mu = e^2 v^{-1} c^{-1} \int \mu_1 \beta_o (\beta\beta_\mu^{-1} - 1)\, \omega d\omega, \quad (11)$$

and $$W_\mu = e^2 c^{-2} \int \mu_1 (\beta_o \beta_\mu^{-1} - \overset{o}{v}_3)\, \omega d\omega, \quad (13)$$

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A simple method of calculating ... S/051/63/014/001/020/031
E032/E514

when $$v_3\sqrt{\varepsilon_1\mu_1} - c < 0, \quad (12)$$

and $$v_3\sqrt{\varepsilon_1\mu_1} - c > 0, \quad (14)$$

respectively. In these expressions $\beta_o = (\varepsilon_1, \mu_1)^{-\frac{1}{2}}$, ε_1 and μ_1 are the permittivity and the permeability in directions at right-angles to the optic axis, respectively, and $\overset{o}{v}_1$ and $\overset{o}{v}_3$ are the direction cosines of the direction of the velocity of the point charge. The corresponding expressions for the ordinary waves are also given. It is stated that the method employed in deriving these expressions can be generalized to the case where the point object moving through the crystal possesses multipole moments.

SUBMITTED: December 30, 1961

Card 2/2

L 10181-63 EWT(1)/BDS/ES(w)-2--AFFTC/ASD/
ESD-3/SSD--Pab-4--IJP(C)
ACCESSION NR: AP3003421

S/0051/63/015/001/0123/0124

AUTHOR: Kukanov, A. B.

64

TITLE: Note on Cerenkov absorption of electromagnetic radiation

62

SOURCE: Optika i spektroskopiya, v. 15, no. 1, 1963, 123-124

TOPIC TAGS: Cerenkov effect, stimulated Cerenkov effect, particle acceleration, Cerenkov particle acceleration, electromagnetic acceleration of particles

ABSTRACT: The article deals with additional considerations concerning the stimulated Cerenkov effect in connection with an analysis by V. N. Tsy*tovich (DAN SSSR, 142, 319, 1962) of the motion of a Dirac electron in an infinite transparent medium in the presence of electromagnetic energy as a result of which the electron may be accelerated. Deriving a general expression for the maximum acceleration of an electron due to Cerenkov absorption of pumping radiation, the author quotes a few examples involving specific media. Thus in water the maximum acceleration reaches 6 x 10 sup 4 ev/cm and for an electron occurs at an

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ACCESSION NR: AP3003421

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emissive energy threshold of 0.77 Mev. In hydrogen (0C and 760 mm Hg) the acceleration is 1 ev/cm at an energy value of 8.30 Mev. When the electron energy rises above the threshold value, acceleration decreases linearly, thus creating a difficulty in the possible application of the stimulated Cerenkov effect to the acceleration of charged particles. Since the acceleration is directly proportional to the mass and charge of a particle, the study of Cerenkov absorption by bunches of charged particles is of particular interest. "The author sincerely thanks A. A. Sokolov for his advice and B. M. Bolotovskiy for his friendly evaluation of the work." Orig. art. has: 6 formulas.

ASSOCIATION: none

SUBMITTED: 26Jul62 DATE ACQ: 30Jul63 ENCL: 00

SUB CODE: 00 NO REF SOV: 004 OTHER: 001

djk/ak
Card 2/2

L 13107-63 EWT(1)/BDS AFFTC/ASD

ACCESSION NR: AP3003422 S/0051/63/015/001/0124/0126

AUTHOR: Kukanov, A.B.; Thai K'uang

52

TITLE: On Vavilov-Cerenkov radiation by magnetic and electric moments in a transparent uniaxial crystal

SOURCE: Optika i spektroskopiya, v.15, no.1, 1963, 124-126

TOPIC TAGS: Cerenkov radiation, uniaxial medium, energy loss

ABSTRACT: Vavilov-Cerenkov (hereinafter Cerenkov) radiation in a transparent uniaxial crystal has been considered by a number of authors. For calculating the energy loss for Cerenkov radiation by the magnetic and electric moments in a transparent ferrodielectric crystal the present authors used the method proposed earlier by A.B.Kuklanov (Optika i spektroskopiya,14, 121, 1963) to reduce the complex integration problem to the solution of a few standard integrals. The authors use a rectangular system of coordinates and adduce two equations for the energy radiated by the electric and magnetic moments over a unit path. In the particular case of an isotropic medium the formulas simplify to the expressions obtained by other authors for such media. "The authors are sincerely grateful to A.A.Sokolov for his interest in the work."

Card 1/2

S/137/60/000/011/029/043
A006/A001

Translation from: Referativnyy zhurnal, Metallurgiya, 1960, No. 11, p. 238, # 27147

AUTHORS: Kukanov, A.S., Yegolayev, V.F.

TITLE: The Effect of a Surface-Active Medium on Hardness Changes of Polycrystalline Metals Subjected to Cold Hardening

PERIODICAL: Uch. zap. Petrozavodskogo un-ta, 1957 (1958), Vol. 5, No. 4, pp. 132 - 139

TEXT: The authors studied the effect of various surface-active substances on changes in microhardness H_μ of brass, bronze, Al and steel. Solutions of different concentration of olein and stearin acids in pure vaseline oil were used as surface-active substances. Cold hardening of specimens was performed with a striking pendulum. It is shown that as a result of the effect of surface-active substances in cold hardening H_μ increases; H_μ of cold hardened metals decreases under the effect of the surface active substances at the three initial oscillations of the pendulum. All the dependence curves of H_μ on the number of pendulum os-

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S/137/60/000/011/029/043
A006/A001

The Effect of a Surface-Active Medium on Hardness Changes of Polycrystalline Metals Subjected to Cold Hardening

cillations show a maximum; this indicates a reduced number of defects on the specimen surface during cold hardening. It is shown that the effect of surface active substances on metal that was already cold hardened appears weaker in all cases. There are 5 references.

Z.F.

Translator's note: This is the full translation of the original Russian abstract.

Card 2/2

SHUSHUNOV, V. A.

USSR/Chemistry - Insecticides Apr 51

"Kinetics of the Photochlorination of Benzene,"
V. A. Shushunov, G. M. Strongin, Yu. I. Gryzin,
A. V. Kukanov, Inst Chem, Gor'kiy State U

"Zhur Fiz Khim" Vol XXV, No 4, pp 404-408

Worked out methods for photochlorination of C_6H_6 with Hg-arc light (λ =4360 Å). Reaction proceeded autocatalytically, requiring induction period from whose temp coeff calcd was 10/kcal/mol. Proposed mech of formation of active centers from which chain reaction starts. Based on reacted C_6H_6 and Cl, product was 95% hexachlorocyclohexane, 5% oily substances.

180T22

GRODZOVSKY, G.L.; KUKANOV, F.A. (Moscow):

"Gas tank rupture in vacuum."

report presented at the 2nd All-Union Congress on Theoretical and Applied Mechanics, Moscow, 29 Jan - 5 Feb 64.

L 51455-65 EWA(h)/EWT(d)/EWT(m)/T-2/EWA(d)/EWP(w)/EWP(v)/EW ... P?-4/... EM/

... NR: AP5011329 UR/0258/65/005/002/0352/0355
531.353

AUTHOR: Grodzovskiy, G. L. (Moscow); Kukanov, F. A. (Moscow)

TITLE: Fragmentation of a ruptured vessel in a vacuum

SOURCE: Inzhenernyy zhurnal, v. 5, no. 2, 1965, 352-355

TOPIC TAGS: fragmentation problem, gas filled vessel, gas escape mechanism, ... process, adiabatic process

... The authors solve problems on the motion ... produced by the rupture of a gas-fi... ...ental assumptions on the mechanism of gas escape ... rupture ... write expressions describing motion ... for both fragments. Specific calcula... ... and adiabatic processes of gas escape. ... was reduced to the form $f''' + ff'' = 0$, the latter to $f''' + f''^{n} = 0$, at initial conditions given by

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L 5 [illegible]

ACCESSION NR: AP5011329

$$\eta = 0\ f = 0,\ f' = 0,\ f'' = 1.$$

[illegible] results of digital computer calculations are presented in tabular [illegible] art. has: 1 table and 23 formulas.

ASSOCIATION: None

SUBMITTED: 29Oct64 ENCL: 00 SUB CODE: ME

NO REF SOV: 000 OTHER: 001

KUKANOV, I.A., sanitarnyy vrach

Prevention of silicosis in Novgorod Province. Gig. i san. 26 no.2: 77-80 F '61. (MIRA 14:10)

1. Iz Novogorodskoy oblastnoy sanitarno-epidemiologicheskoy stantsii.
(NOVGOROD PROVINCE--LUNGS--DUST DISEASES)
(DUST--REMOVAL)

1. KUKANOV, V. M.

2. USSR (600)

4. Krasnokamsk Region - Halogens

7. Hydrogeological characteristics and an appraisal of the resources of the Krasnokamsk iodine-bromine water deposits of the coal-bearing strata of the Lower Carboniferous. /Abstract/. Izv.Glav.upr.geol.fon. no.3 1947

9. Monthly List of Russian Accessions, Library of Congress, ~~March~~ 1953, Uncl.

1. KUKANOV, V. M.

2. USSR (600)

4. Water, Underground - Russian Platform

7. Origin of the subterranean iodine-bromine waters of the Palezoic of the Russian Platform. (Abstract.) Izv.Glav.upr.geol.fon. no. 3, 1947

9. Monthly List of Russian Accessions, Library of Congress, March 1953, Unclassified.

1. KUKANOV, V. M. - ZNAMENSKIY, V. A.

2. USSR (600)

4. Water, Underground - Ural Mountains

7. Preliminary hydrogeological survey of the subterranean waters in the regions of the western Ural Permian foothills. (Abstract.) Izv.Glav.upr.geol.fon. no.3, 1947

9. Monthly List of Russian Accessions, Library of Congress, March 1953, Unclassified.

1. KUKANOV, V. M.

2. USSR (600)

4. Ural Mountains - Halogens

7. Geological surveys of the iodine-bromine and mineral waters of the petroleum deposits in the Ural foothills (in the fields of the "Prikamneft'," "Bashneft'," and "Tuimazaneft'" Trusts. (Abstract.) Izv.Glav.upr.geol.fon. no. 3, 1947

9. Monthly List of Russian Accessions, Library of Congress, March 1953, Unclassified.

1. KUKANOV, V. M.

2. USSR (600)

4. Molotov Province - Petroleum

7. Hydrogeological method of revealing petroleum-bearing formations. (Abstract) Izv.Glav.upr.geol.fon. No. 3 - 1947.

9. Monthly List of Russian Accessions, Library of Congress, March 1953. Unclassified.

VOLODINA, A.S.; IVANOVA, Z.P.; CHUDAKOVA, A.P.; KUKANOVA, V.I.;
POPOV, N.V., red.; MILIKESOVA, I.F., tekhn. red.

[Album of wood-cutting instruments] Al'bom derevorezhushchego instrumenta. Moskva, TSentr. in-t tekhn. informatsii i ekon. issl. po lesnoi, bumazhnoi i derevoobrabatyvaiushchei promyshl., 1962. 353 p. (MIRA 17:3)

1. Moscow. Nauchno-issledovatel'skiy institut derevoobrabatyvayushchego mashinostroyeniya.

KUKAREKA, N., szerelolakatos

Highly-esteemed duty. Munka 5 no.3:47-50 Mr '55.

1. Minszki "Vorosilov" szerszamgepgyar szerelomuhelyenek tarsadalmi munkavedelmi felugyeloje.

KUKARIN, A., inzhener-polkovnik, kand.tekhn.nauk; KOLESNIKOV, A., inzhener-podpolkovnik, kand.tekhn.nauk

Winter is no obstacle for tanks. Starsh.-serzh. no.1:24 Ja '61.
(MIRA 14:7)

(Tanks (Military science)--Cold weather operation)

KUKARIN, A., kand.tekhn.nauk, inzh.-polkovnik; KOLESNIKOV, A., kand. tekhn.nauk, inzh.-podpolkovnik

Without overheating. Starsh.-serzh. no.6:29 Je '61. (MIRA 14:10)

(Tanks (Military science))

KUKARIN, A., inzhener-polkovnik

If a tank bogs down. Starsh.-serzh. no.6:35 Je '62. (MIRA 15:7)
(Tanks (Military science))

KUKARIN, A., inzhener-polkovnik, dotsent, kand.tekhn.nauk

Motion-picture training apparatus for tank driving instruction.
Voen. vest. 42 no.8:70 Ag '62. (MIRA 15:7)
(Tanks (Military science))

L 06453-67 EWT(1)/EWT(m)/EWP(t)/ETI IJP(c) JD/JG

ACC NR: AP6024542 SOURCE CODE: UR/0089/66/021/001/0049/0050

AUTHOR: Kukarin, A. I.; Khovanovich, A. I.

ORG: none

TITLE: Ionization chamber with silver electrodes for the measurement of fluxes of thermal neutrons at high levels of accompanying gamma radiation

SOURCE: Atomnaya energiya, v. 21, no. 1, 1966, 49-50

TOPIC TAGS: thermal neutron, reactor neutron flux, gamma background, ionization chamber, beta decay

ABSTRACT: The described chamber (Fig. 1) uses electrodes of Ag^{107} (51.9%) and Ag^{109} (49.1%) (natural isotope mixture), which are transformed into β-active Ag^{108} and Ag^{110} by the thermal neutrons, and the neutron flux is determined from the ionization produced by the decay of these isotopes. Since the chamber current is measured after the irradiation, the gamma background does not influence the measurements. The use of a multirange microammeter permits measurement of thermal neutron fluxes from 10^8 to 10^{13} neut/cm^{2}sec. Larger fluxes can be measured by reducing the irradiation time or by increasing the measured current range. To ensure saturation, a voltage source of 3 kv and 300 a is required. The proposed procedure can also be used to measure integral ffluxes of thermal neutrons from pulsed sources. The accuracy is within ±10%. Orig. art. has: 2 figures and 2 formulas.

Card 1/2 UDC: 539.107.48

L 06453-67

ACC NR: AP6024542

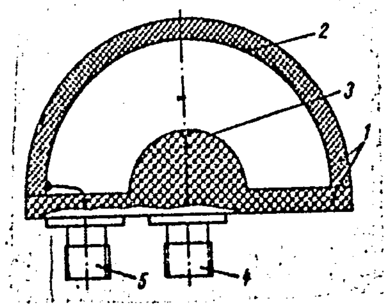

Fig. 1. Diagram of ionization chaber. 1 - Plexiglas housing, 2,3 - electrodes, 4,5 - current leads

SUB CODE: 18/ SUBM DATE: 23Dec63

Card 2/2

20082
S/105/61/000/004/001/003
B116/B206

26.2351

AUTHORS: Drozdov, N. G., Kukarin, A. I., Savashkevich, B. S., and Gorelov, N. I. (Moscow)

TITLE: Electrostatic generator

PERIODICAL: Elektrichestvo, no. 4, 1961, 48-50

TEXT: An electrostatic generator is described, the operation of which is based on the following principle: Plexiglass is always positively charged when brought into contact with polyethylene and Teflon, while Teflon is negatively charged thereby and polyethylene changes the sign of its charge, depending on whether it comes into contact with Plexiglass or Teflon. Dielectrics which are charged only positively or only negatively are called positive and negative dielectrics, respectively. Those which change the sign of their charge are called intermediate dielectrics. For an alternating interaction between the intermediate dielectric and the positive and negative dielectric, respectively, the maximum charge density δ_{max} on the surface is expressed by $\delta_{max} = \varepsilon E/4\pi$, where E is the breakdown strength of the

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B116/B206

Electrostatic generator

electric field, and ε the dielectric constant of the interspace between rotor and stator. Maximum charge density is obtained much more quickly with an interaction of three dielectrics than with one of only two. Such favorable conditions also result when the intermediate dielectric is displaced from the negative to the positive dielectric. Some consecutive interactions are sufficient for obtaining the biggest possible charge. Electrostatic d-c and a-c generators may be designed on this principle. A schematic representation of an electrostatic d-c generator is shown in Fig. 1. The stator consists of Plexiglass (1) and Teflon (2). The rotor is a Plexiglass cylinder with metal plates (3). The charges on the inner face of the stator are excited by polyethylene brushes (4) mounted on the rotor. The electric field of the stator induces opposite charges on the plates (3). When the plates approach the collectors K_1 and K_2, the free charges leak off, while the bound charges are retained. After the latter have reached the range of action of the other dielectric, they become additional free charges and amplify the free main charge of the rotor plates. Fig. 3 shows the dependence of the short-circuit current on the position of the collectors and on the direction of rotor movement. If the collectors

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S/105/61/000/004/001/003
B116/B206

Electrostatic generator ...

are placed at 0 and 180°, the generator polarity changes according to the direction of rotor movement. This can be utilized in dosimetric circuits for accurate voltage adjustment when charging reservoir and feeder capacitors. Fig. 4 shows the characteristics of the generator during charging and discharging of a capacitor of 10^{-7} f. The charging takes place according to an exponential law, the discharging almost according to a linear law. Fig. 5 shows the dependence of the short-circuit current on the rotor speed. Alternating current can also be obtained from the electrostatic generator described. For this purpose it is sufficient to unite all rotor plates into two groups and to connect these to the two contact rings. When using Teflon, Plexiglass, and polyethylene, such generators operate perfectly under hardest climatic conditions at a humidity of up to 98% and temperatures of from -40 to +50°C. There are 5 figures and 3 references: 1 Soviet-bloc.

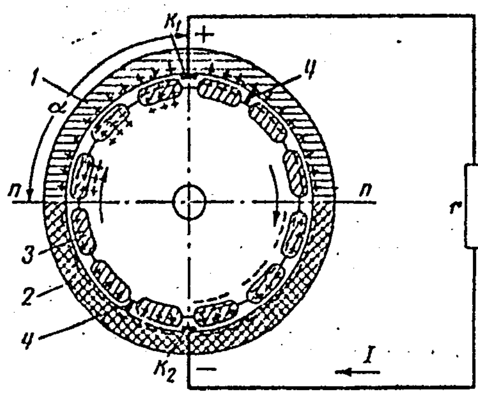
SUBMITTED: June 23, 1960

20082

S/105/61/000/004/001/003
B116/B206

Electrostatic generator

Fig. 1



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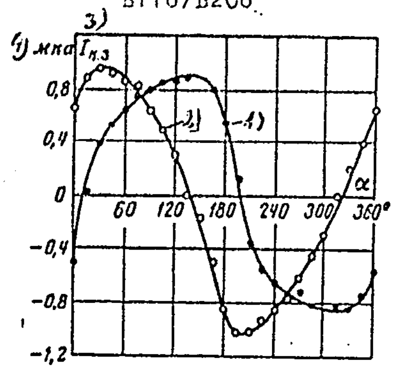
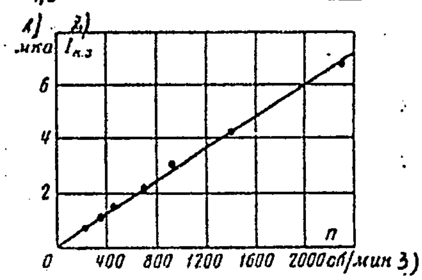
B116/B206

Electrostatic generator

Fig. 3: Dependence of the short-circuit current on the angle at which the collectors are placed. Legend: 1) Forward rotor movement; 2) reverse rotor movement, n = 232 rpm 3) $I_{short\text{-}circuit}$; 4) μA.



Legend to Fig. 4: 1) forward movement; 2) reverse movement; 3) min; 4) rpm; 5) kv.



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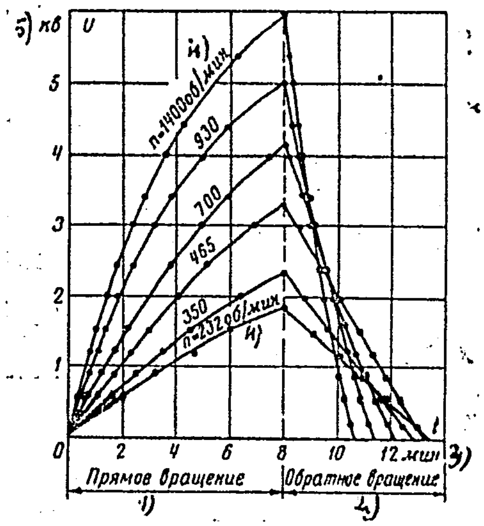
B116/B206

Electrostatic generator



Legend to Fig. 5: 1) μA; 2) $I_{short-circuit}$; 3) rpm.

Card 6/6

9,6150

32646
S/105/62/000/001/003/006
E032/E414

AUTHORS: Drozdov, N.G., Gorelov, N.I., Savashkevich, B.S., Kukarin, A.I. (Moscow)

TITLE: Semiconducting cadmium sulphide detectors of gamma radiation

PERIODICAL: Elektrichestvo, no.1, 1962, 49-51

TEXT: In 1957, the present authors developed semiconducting detectors ГП-1 (GP-1) whose sensitivity to Co^{60} gamma rays reached 20 µA per 1 r/hr. This work was directed by S.M.Ryvkin. The inertia of these detectors was comparable to that of single crystals of CdS. The semiconducting detectors were produced by sublimation of cadmium sulphide powder on to a heated conducting base which served as one of the electrodes of the detector. The second electrode was deposited by vacuum evaporation on to the cadmium sulphide layer. Technological modifications enabled the present authors to improve the characteristics of these detectors. In the present paper they report the results of measurements of the parameters of the detectors. It was found that the volt-ampere characteristics in the absence of ionizing radiation are unipolar and practically linear between 1.5 and 10 V. The dark

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Semiconducting cadmium sulphide ... E032/E414

current at 10 V was found to lie between 25 and 80 μA. The response of the detectors to gamma radiation is nonlinear and may be represented by

$$I = uK^{\alpha} \qquad (1)$$

where I is the total current flowing through the detector, U is the potential difference across the electrodes and k and α are constants. For most specimens α was found to lie between 1.1 and 1.6. The CdS detectors may be used with U = 1.5 V for which in most specimens the dark current does not exceed 5% of the current due to gamma rays when the dose rate is 10 r/hr. The sensitivity was measured under steady-state conditions with U = 10 V. For photosensitive layers of surface area 1.5 cm^2 and thickness 1 mm, the sensitivity of most specimens for Co^{60} gamma rays was 100 to 300 μA per 1 r/hr. In isolated cases, this figure rose to 500 to 700 μA per 1 r/hr. It was found that the current was directly proportional to the dose rate up to 500 r/hr. Below 300 keV the sensitivity rapidly increased, and at 90 keV was found to be greater than that for Co^{60} gamma rays by a factor of 15. The variation in the sensitivity may to some extent be

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counteracted by the use of suitable filters, e.g. 1.5 to 2 mm thick lead plate. The inertia of the detectors was found to be independent of the applied voltage in the range 1.5 to 10 V. Fig.4 illustrates the inertia properties of the detectors. In this figure τ_H is the time for the photocurrent to increase from zero to 0.8 of its maximum value on irradiation (dark current subtracted) and τ_c is the time necessary for the current to fall to 0.2 of the maximum value after the gamma-ray beam has been cut off. These two time constants are plotted in Fig.4 as a function of the dose rate in r/hr. The inertia may be reduced in practice by placing the detector in a permanent radiation field. The stability of the detectors was highest for gold electrodes. The maximum variation in the sensitivity over a period of 5 months was less than 3% of the average value. The corresponding variation in the dark current was 25%. Under humid conditions (humidity greater than 80%) the dark current increased but could be reduced again with the aid of a drying agent. The properties of the detectors were not affected by exposure to a very high dose, e.g. 5×10^7 r at 2.5×10^6 r/hr. It is stated that the main disadvantage of these detectors is their inertia, but it is

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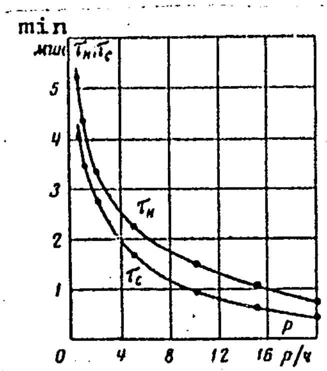
expected that this will be eliminated in the near future. There are 4 figures and 2 references: 1 Soviet-bloc and 1 non-Soviet-bloc. The reference to an English language publication reads as follows: Ref.2: Lewis E., Hollander Jr., Nucleonics, no.10, 1956, 68.

SUBMITTED: December 31, 1960

Fig.4.



KUKARIN, G.A.

Aralia manshurica rupr. et maxim. Apt.delo 9 no.1:69-70 Ja-F '60. (MIRA 13:6)

1. Aptechnoye upravleniye, Khabarovsk. (GINSENG)

KUKARIN, G.A.

Drugstore of communist labor. Apt. delo 10 no. 1:64 Ja-F '61.
(MIRA 14:2)

1. Nachal'nik Khabarovskogo rayevogo Aptekoupravleniya.
(PEREYASLAVKA (KHABAROVSK TERRITORY)--DRUGSTORES)

KUKARIN, G.A.

Collective material responsibility in pharmaceutical enterprises of the Khabarovsk Territory. Apt. delo 11 no.2:54-55 Mr-Ap '62. (MIRA 15:5)

1. Khabarovskoye krayevoye aptechnoye upravleniye.
(KHABAROVSK TERRITORY--PHARMACY)

KUKARIN, G.A.

Cases of poisoning with the tincture of Aralia mandshurica. Mat. k izuch. zhen'. i drug. lek. rast. Dal'. Vost. no.5:261-263 '63. (MIRA 17:8)

1. Khabarovskoye krayevoye aptekoupravleniye.

KUKARIN, Sergey Vladimirovich; DIKAREVA, A.I., red.; SVESHNIKOV, A.A., tekhn. red.

[Present state and trends in the future development of microwave devices; survey of foreign literature] Sovremennoe sostoianie i tendentsii razvitiia priborov SVCh; po materialam inostrannoi literatury. Moskva, Izd-vo "Sovetskoe radio," 1962. 232 p. (MIRA 15:6)

(Microwaves) (Electronic apparatus and appliances)

KUKARIN, V.A.

121-8-19/22

AUTHOR: KUKARIN, V.A.

TITLE: The Cutting of Multiple Threads on Thread-Cutting Lathe Model 1616 P. (Narezaniye mnogozakhodnykh rezb na tokarno - vintoreznom stanke mod. 1616 P.)

PERIODICAL: Stanki i Instrument, 1957, Vol. 28, Nr 8, pp. 40-40 (USSR)

ABSTRACT: For the cutting of multiple threads in centers a special graduated plate is used. In order to be able to carry out this work also in the chuck and in order to avoid possible errors of the graduated plate the thread graduation on thread-cutting lathe mod. 1616 P can also be fixed by means of a reversing device of the feed of the lathe. The illustrations shows and explains in detail this reversing device. The possibility of the cutting of multiple threads is secured by selecting the number of teeth of the transformation gear of the feed reversing device in such a way that they are divisible by the numbers of threads per unit of the threads to be cut.

ASSOCIATION: Not given

PRESENTED BY:

SUBMITTED:

AVAILABLE: Library of Congress

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KUKARIN, V. A.

The 1F616 semiautomatic chuck lathe. Biul. tekh.-ekon. inform. Gos. nauch.-issl. inst. nauch. i tekh. inform. no.12:38-40 '62. (MIRA 16:1)

(Lathes)

15(2)

AUTHOR: Kukarkin, A. I. SOV/72-59-4-13/21

TITLE: On the Use of Open-hearth Dinas Bricks for the Construction of the Roof of a Tank Furnace (Primeneniye martenovskogo dinasa dlya kladki svoda vannoy pechi)

PERIODICAL: Steklo i keramika, 1959, Nr 4, pp 41 - 43 (USSR)

ABSTRACT: In the Magnitogorsk Glass Works the durability of the furnace roof was only 11 months due to a deficient construction of the burners as well as to a small thickness of the main roof (300 mm at a span of 7200 mm). After the elimination of these deficiencies open-hearth Dinas bricks were used for the construction of the roof, as suggested by the author of this paper. The Dinas bricks GOST 3910-47 for Glass Works are either hand-made or produced by presses with low pressure and do not meet the demands in the author's opinion. During the last years the roofs of Martin furnaces had annular shape (Figs 1 and 2) as may be seen from the paper by G. N. Belyavskiy, P. N. Rybin (Ref 1). The composed roofs are either annular or joint. Preference is given to the annular shape since it may be easily repaired. In figure

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On the Use of Open-hearth Dinas Bricks for the Construction SOV/72-59-4-13/21
of the Roof of a Tank Furnace

3 the reinforced roof of a Martin furnace is shown. In the Magnitogorsk Glass Works the roof was of annular shape (Fig 1) with bricks of the PM-11 type (460 x 150 x 90) and of PM-24 (460 x 150 x 88 x 80). The tank furnace was heated within 5 days (Fig 4). The roofs may be constructed in annular shape only in those cases where the Dinas bricks may be welded together. An increase of the thickness of the roof by 1.5 times - in the case of a correct construction of the furnace burner - will prolong the working time of the roof by 2 to 2.5 times. There are 4 figures and 1 Soviet reference.

ASSOCIATION: Magnitogorskiy stekol'nyy zavod (Magnitogorsk Glass Works)

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15 (2)

AUTHOR: Kukarkin, A. I. SOV/72-59-12-11/19

TITLE: Use of Martin Dinas Bricks for Bricking of Burner Arches and Semicircle Arches of Regenerators

PERIODICAL: Steklo i keramika, 1959, Nr 12, pp 35-37 (USSR)

ABSTRACT: The insufficient assortment of standard Dinas products makes their squaring to measure necessary thus causing the duration of furnace repair to be prolonged and the cost to be raised. In the Magnitogorskiy zavod (Magnitogorsk Works) the cost of squaring is approximately 10% of the cost of a total cold furnace repair in bricking of semicircle arches of regenerators and burner arches of tank furnaces with glass Dinas bricks (steklodinas) of the SD-11 and SD-12 types. For reasons of economy Martin bricks on store were used which were produced in the chamotte Dinas department of the Magnitogorskiy metallurgicheskiy kombinat (Magnitogorsk Metallurgical Kombinat) in accordance with GOST 6024-51 (dimensions) and GOST 4157-48 (technological conditions). The correlation of the amount of wedge-shaped and rectangular bricks in radial bricking is determined by formulas as may be seen from the paper by I. Sh. Shvartsman (Ref 1). The burner arches and those

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Use of Martin Dinas Bricks for Bricking of Burner Arches and Semicircle Arches of Regenerators SOV/72-59-12-11/19

of the regenerators are made as annular-shaped bricking. The advantages of the latter are described by the author in an earlier paper (Ref 2). As is shown by the table the Martin Dinas bricks may be used by all glassworks of the USSR. In conclusion, the author states that in the production of a new brick type of the dimensions 300 x 150 x 65 x 40 and in using the present types of Martin Dinas bricks any burner- or regenerator arches of tank furnaces may be bricked without previous squaring. Thus the amount of work and the use of Dinas bricks is reduced and the stability of bricking is increased. There are 1 table and 2 Soviet references.

ASSOCIATION: Magnitogorskiy stekol'nyy zavod (Magnitogorsk Glass Works)

Card 2/2

KUKARKIN, A.I.

Efficient designs of burners for tank furnaces. Stek.i ker. 17 no.5:16-18 My '60. (MIRA 13:8)
(Glass furnaces) (Burners)

KUKARKIN, A. I.

Improve the designs of burners for glass-melting tank furnaces.
Stek. i ker. 17 no.8:14-17 Ag '60. (MIRA 13:8)
(Glass furnaces)

KUKARKIN, A.I.

Increasing the height of the checkers in continuous tank furnaces.
Stek. i ker. 22 no.7:31-32 Jl '65. (MIRA 18:9)

1. Peskovskiy steklotarnyy zavod.

KUKARKIN, A.S.; BAKIN, S.V.; KITAYEV, B.I.

Distribution of gas velocities in blast furnace charge materials. Izv.vys.ucheb.zav.; chern.met. 8 no.6:33-37 '65. (MIRA 18:8)

1. Ural'skiy politekhnicheskiy institut.

KITAYEV, B.I.; KUKANKIN, A.S.

Hydrodynamic phenomena in the blast furnace bosh. Izv. vys. ucheb. zav.; chern. met. no.10:40-45 '60. (MIRA 13:11)

1. Ural'skiy politekhnicheskiy institut.
(Blast furnaces--Fluid dynamics)

KUKARKIN, A.S.; KITAYEV, B.I.; TIKHONOV, V.P.

Hydrodynamic phenomena in blast furnace charge layers and their effect on changes in the hot blast pressure on tuyeres. Izv. vys. ucheb. zav.; chern. met. 4 no.12:27-30 '61. (MIRA 15:1)

1. Ural'skiy politekhnicheskiy institut.
(Blast furnaces) (Gas dynamics)