cubic focusing as an example, in analogy with the

Card 1/2

L 51069-65

ACCESSION NR: AP5009108

mate calculations are made of the size of the stability region, of the adiabatic damping, the mechanism of transverse auto-phasing, and the influence of the various perturbations. The accelerator is found to have quantitative characteristics close to those of the ordinary strong-focusing accelerator, and to offer no advantages over ordinary accelerator with usual linear focusing, but is of interest

accelerated beam is produced. Orig. art. has: 32 formulas.

SUBMITTED: 19Mar64 ENCL: 00 SUB CODE: NP

NR REF SOV: 004 OTHER: 000

Card 2/2

L 63083-65

ACCESSION NR: AP5017781 UR/0080/65/038/007/1605/1606
542.61+546.65

AUTHOR: Shvedov, V. P.; Orlov, Yu. F.

TITLE: Separation of rare earth elements by certain phosphorus-containing extracting agents

SOURCE: Zhurnal prikladnoy khimii, v. 38, no. 7, 1965, 1605-1606

TOPIC TAGS: cerium, praseodymium, neodymium, organophosphorus compound, extraction separation

ABSTRACT: The effect of the composition of a series of organophosphorus extracting agents on the separation of Ce(III) - Pr and Pr - Nd pairs was studied. The separation factors were determined for extraction from an aqueous phase containing a mixture of the two rare earth elements and the salting-out agent, aluminum nitrate. The mechanism of extraction of cerium and probably the other elements may be represented by the reaction

$$Ce^{3+} + 3NO_{3aq}^{-} + 3S_{org} \rightleftarrows Ce(NO_3)_3 \cdot 3S_{org},$$

where S is a molecule of the extracting agent. Constants for this equilibrium

Card 1/2

L 63083-65
ACCESSION NR: AP5017781

(i. e., extraction constants) are given; they constitute a measure of the extracting capacity of the agents employed. In the latter, changes in the nature of the substituents strongly affect the extracting capacity, but have virtually no effect on the separation factors of the Ce(III) - Pr and Pr - Nd pairs. However, when tricyclohexyl and tri-sec-butyl phosphate are used, a certain decrease in separation factors is observed relative to the other extracting agents. Orig. art. has: 1 table and 1 formula.

ASSOCIATION: None

SUBMITTED: 30Nov64 ENCL: 00 SUB CODE: IC

NO REF SOV: 006 OTHER: 001

KG

Card 2/2

ORLOV, Yu.F., Cand Phys Math Sci,--(diss) "Non-linear theory of betatron oscillations in the synchrotron with fixed focusing." Mos, 1956, 12 pp. with illustrations (Min of Higher Education USSR. Yerevan State Univ)

125 copies (KL, 39-58, 106)

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

Category : USSR/Nuclear Physics - Origin of charged and neutral particles through matter

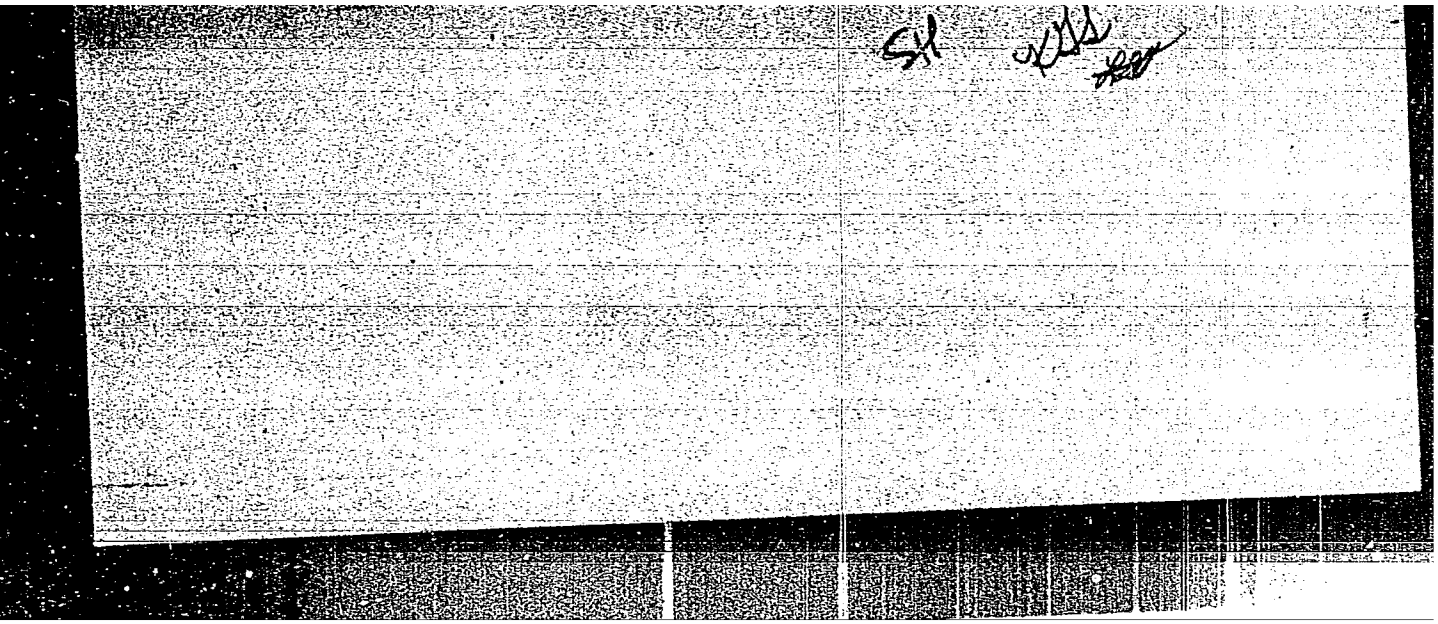
Abs Jour : Ref Zhur - Fizika, No 1, 1957, No 591

Author : Orlov, Yu.F.
Title : Energy Spectrum of Ionizing Particles of High Energies after Passing Through a Thick Layer

Orig Pub : Zh. eksperim. i teor. fiziki, 1956, 30, No 3, 613-614

Abstract : A more accurate shape is obtained for the spectrum of particles, experiencing ionization losses of energy in a thick layer of substance. It is shown that if the initial energy is sufficiently high ($L_i m_e E_0/\mu^2 \gg 1$, where L_i is the ionization logaritym and μ the rest energy of the ionizing particle), the shape of the spectrum differs from Gaussian even near the end of the range. With this, the curve has the characteristic "tail" on the low-energy side and a steep decent in the high-energy side. The maximum of the spectrum is displaced away from the center of gravity towards the high-energy side.

Card : 1/1



APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238

PA - 2068

AUTHOR: ORLOV, YU.F.

TITLE: Excitation of Betatron Oscillations by Synchrotron Momentum Oscillations in a Strong Focussing Oscillator. (Vozbuždenie betatronnych kolebanij sinchrotronnymi kolebanijami impul'sa v uskoritele s sil'noj fokusirovkoj, Russian)

PERIODICAL: Zhurnal Eksperimental'noi i Teoret.Fiziki, 1957, Vol 32, Nr 1, pp 130-134 (U.S.S.R.)
Received: 3 / 1957 Reviewed: 4 / 1957

ABSTRACT: The present paper proves the existence of resonances between the synchrotron oscillations of the momentum p and the bienniums (?) of the amplitude near the resonance.

The equations of the motion and resonances: The simultaneous effect of the disturbances of the magnetic field and of the betatron frequencies by synchrotron momentum oscillations is examined. The simultaneous effect of the paramagnetic resonance is insignificant. As an example the radial oscillations are studied. The initial equation is therefore set up in the following form:

$$\frac{d^2r}{d\theta^2} - \left(\frac{1}{2\pi}\right)^2 \frac{\partial H/\partial r}{Po}\, r + \left(\frac{1}{2\pi}\right)^2 \frac{\partial H/\partial r}{Po}\, \frac{\Delta p}{p}\, r = \left(\frac{1}{2\pi}\right)^2 \frac{\Delta H}{Po}$$

Here $1/P_o = e/cp_o = 1/H_o\varrho_o$, and ϱ_o denotes the radius of the unperturbed closed orbit, l - length of the periodic sector,

Card 1/3

PA - 2068

Excitation of Betatron Oscillations by Synchrotron Momentum Oscillations in a Strong Focussing Oscillator.

$\Theta = (2\pi/l)s$; s - the coordinate taken along the unperturbed closed orbit. The small synchrotron momentum oscillations are described by the term $\Delta p/p$. The gradient $\partial H_0/\partial r$ of the magnetic field has the period 2π. The general solution of the unperturbed equation ($\Delta p/p = \Delta H = 0$) has the form

$r = a\varphi^* + a^*\varphi$, $\varphi(\Theta) = f(\Theta) \exp(i \nu \Theta)$, $f(\Theta) = f(\Theta + 2\pi)$. Here φ denotes the FLOCKE function and ν - the known betatron quasi-frequency. The solution ansatz for the equation written down at the beginning is explicitly given. The resulting equation can be solved in the usual way, if first the general solution of the equation for $\Delta H = 0$ and then the solution of the complete equation is found. With $\nu = k/M - 1/2$ M there are two resonances: the so-called external resonance (the usual resonance in case of disturbances of the magnetic field) and the paramagnetic resonance. In the case of $\nu = k/M - 1/2$ M only paramagnetic resonance exists (resonance in the case of the disturbance of a gradient).

Card 2/3

PA - 2068

Excitation of Betatron Oscillations by Synchrotron Momentum Oscillations in a Strong Focussing Oscillator.

The Passage through the resonances in linear approximation: Only the passage through the first resonances n = 2,3,4.5 is essential. For the maximum increase of r after passage through the resonance a formula is given. For vertical oscillations similar formulae as those derived here are applicable.

The effect of non-linearity in the case of passage through resonance can be taken into account by a substitution mentioned here. When passing through the resonance a^2 contains a constant, an oscillation, and a slowly increasing term. The significance of these terms is explained here in short. In conclusion the safety condition, which it is not difficult to satisfy, is obtained.

ASSOCIATION: Not given
PRESENTED BY:
SUBMITTED:
AVAILABLE: Library of Congress

Card 3/3

ORLOV, YU. F.

PA - 2678

AUTHOR: ORLOV, YU.F.

TITLE: Non-Linear Theory of Betatron Oscillations in a Strong Focussing Synchrotron. (Russian).

PERIODICAL: Zhurnal Eksper. im. i Teoret. Fiziki, 1957, Vol 32, Nr 2, pp 316 - 322 (U.S.S.R.)

Received: 5 / 1957 Reviewed: 6 / 1957

ABSTRACT: The present paper develops a new method for the investigation of betatron resonances. First the equation of the betatron oscillations round a certain plane course in a strong focussing synchrotron are explicitly written down.

The first resonance approximation: One of the main tasks of the theory is the determination of the limits of the so-called security range within these limits. In this security range the amplitude must not exceed a prescribed value. The most attention is required by those values ν_r, ν_z which are on the limit of the security range, i.e. rather close to the exact resonance values. (Here ν_r denotes the frequency of oscillations in the horizontal direction, ν_z the frequency of oscillations in the certical direction). The resonance harmonics can be sorted out from the perturbations and the harmonics of first approximation not belonging to the resonances can be omitted. Such an operation mostly gives good approximation. The method can be considerably improved in the following manner: by a suitable selection of the corresponding

Card 1/2

PA - 2678

Non-Linear Theory of Betatron Oscillations in a Strong Focussing Synchrotron.

variables the resonance equations can be set up in the form of Hamiltonian equations. In practically all important cases the squares A_r^2 and A_z^2 of the amplitudes and certain phase displacements φ_r, φ_z can be used as variables. The Hamiltonian does not depend upon the angular variable Θ.

Parametric resonance: On the left and on the lower limit of the security range the influence of all resonances, except the parametric ones, can be neglected. The corresponding equations are set up. The influence of the non-resonance-dependent harmonics can be investigated by means of the so-called perturbation theory of resonance. The effects of second order cause corrections in the coefficients of resonance equations of first order. Higher approximations are practically of no importance.

ASSOCIATION: Not given
PRESENTED BY:
SUBMITTED:
AVAILABLE: Library of Congress.

Card 2/2

SOV/120-58-5-2/32

AUTHORS: Orlov, Yu. F. and Tarasov, Ye. K.

TITLE: Excitation of Oscillations in an Electron Cyclic Accelerator by Quantum Fluctuations of Radiation (Vozbuzhdeniye kolebaniy v elektronnom tsiklicheskom uskoritele kvantovymi fluktuatsiyami izlucheniya)

PERIODICAL: Pribory i tekhnika eksperimenta, 1958, Nr 5, pp 17-20 (USSR)

ABSTRACT: The effect of considerable growth of oscillations in an electron accelerator was discovered and studied by the authors of Ref.1, and was further investigated in Refs.2 and 3. In Ref.2 this effect was discussed, taking into account the damping of phase and radial oscillations. It was established in Ref.2 that in a usual accelerator with strong focussing, radial oscillations are governed by the formula:

$$r \sim \exp\left(1/2 \int_0^t P_\gamma / E \, dt'\right)$$, where P_γ is the intensity averaged over the frequencies of the quanta, and E is the energy of the particle. Phase oscillations are damped with a decrement equal to $2P_\gamma/E$. In the present paper the

Card 1/3

SOV/120-5-5-7/32

Excitation of Oscillations in an Electron Cyclic Accelerator by Quantum Fluctuations of Radiation

growth of phase and radial oscillations is expressed as a function of a certain general parameter which depends upon the coupling between radial and phase oscillations. The dependence of this parameter on the structure of the magnetic system was discussed in some detail in a previous paper by the present authors (Soviet Physics, 1958, Vol 34 (7), Nr 3, p 449(651) (in English)). General formulae are now obtained for rms amplitudes of phase and radial oscillations which take into account the variation of the magnetic field along the orbit, which is possible in an accelerator with strong focussing. The coupling between the damping factors for phase and radial oscillations is taken into account. The

Card 2/3

SOV/120-58-5-2/32

Excitation of Oscillations in an Electron Cyclic Accelerator by Quantum Fluctuations of Radiation

fluctuations of radiation are considered classically, assuming that the energy of the electrons is much larger than the energy of the quanta emitted by them. There are 2 figures and 3 Soviet references.

SUBMITTED: October 15, 1957.

Card 3/3

SOV/120-58-6-2/32

AUTHORS: Orlov, Yu. F. and Tarasov, Ye. K.

TITLE: Appearance of Instability at Large Gradient in an Electron Accelerator with Strong Focussing (Vozniknoveniye neustoychivosti pri bol'shom gradiyente v elektronnom uskoritele s zhestkoy fokusirovkoy)

PERIODICAL: Pribory i tekhnika eksperimenta, 1958, Nr 6, pp 15-18 (USSR)

ABSTRACT: In the presence of a large gradient (n of the order of a few hundreds) in an electron accelerator, betatron or phase oscillations may become unstable. The effect is the result of radiation and resonance irregularities in the magnetic field when they occur simultaneously.
1) The effect of resonance irregularities of the field upon the damping of phase oscillations. The effects considered in this section occur as a result of a strong dependence of radiation on the position of the electron orbit in an accelerator with strong focussing. If the orbit is displaced from the equilibrium position then the magnetic field along the orbit varies by an amount given by:

$$\Delta H_z = \left(\frac{\partial H_z}{\partial r}\right)_s r, \qquad \Delta H_r = \left(\frac{\partial H_z}{\partial r}\right)_s z \qquad (1)$$

Card 1/4

Appearance of Instability at Large Gradient in an Electron Accelerator with Strong Focussing

as compared with the field on an undisturbed orbit. The radiated power also varies and is given by:

$$P_\gamma = \frac{2e^4}{3m^4c^7} E^2 (H_z^2 + H_r^2) =$$

$$= P_{\gamma s}\left(1 + 2\frac{1}{H_s}\frac{\partial H_s}{\partial r} r + \frac{1}{H_s^2}\left(\frac{\partial H_s}{\partial r}\right)^2 r^2 + \right.$$

$$\left. + \frac{1}{H_s^2}\left(\frac{\partial H_s}{\partial r}\right)^2 z^2\right) .$$

The effect of the linear term in Eq.(2) upon the damping of the oscillations has been discussed in many papers, in particular, in Refs.1 and 2. The non-linear terms have always

Appearance of Instability at Large Gradient in an Electron Accelerator with Strong Focussing

been neglected. However, in the presence of irregularities in the magnetic field along the equilibrium orbit which may be due to, for example, innaccurate lining up of the magnets, the non-linear terms in Eq.(2) may play an important or even decisive role. As is well-known, when field irregularities are present, resonances occur which have a marked effect upon the form and the amplitude of the periodic orbit of an electron. It is shown that instability will occur when:

$$k_1 + \frac{1}{2} < M\nu < k_1$$

where k_1 is an integer and $M\nu$ is the number of oscillations per single turn.

2) The effect upon betatron oscillations. In betatron oscillations one expects an effect of the opposite sign as compared with phase oscillations and this is established in this section for the case of vertical oscillations. In particular, it is shown that instability occurs when:

SOV/120-58-6-2/32

Appearance of Instability at Large Gradient in an Electron Accelerator with Strong Focussing

$$k_1 < M\nu < k_1 + 1/2$$

There is 1 figure and there are 2 Soviet references

SUBMITTED: October 15, 1957.

Card 4/4

SOV/120-58-6-3/32

AUTHORS: Koshkarev, D. G. and Orlov, Yu. F.

TITLE: Parametric Resonances of Phase Oscillations in a Synchrotron (Parametricheskiye rezonansy fazovykh kolebaniy v sinkhrotrone)

PERIODICAL: Pribory i tekhnika eksperimenta, 1958, Nr 6, pp 19-22 (USSR)

ABSTRACT: Parametric resonance in phase oscillations appears when the frequency of the oscillations which depends on the accelerating voltage, is disturbed. The accelerating voltage may be disturbed by, for example, various noise modulations or by pick-up at mains frequency. Since in the process of acceleration the frequency of the oscillations varies within very wide limits, the accelerated particle passes through many weak resonances. When the particles pass through many parametric resonances instability of phase oscillations may set in. A condition is derived for the stability of the phase oscillations and non-linear effects are estimated. The stability condition is derived from an equation of the form:

$$\frac{d\overline{A}^2}{dt} = \left(\frac{\Omega^2}{32}\eta - \rho_2\right)\overline{A}^2 + b \quad , \qquad (17)$$

where A is the amplitude of phase oscillations, Ω is the

Card 1/2

Parametric Resonances of Phase Oscillations in a Synchrotron

frequency, ρ_2 describes the damping and b the effect of other non-parametric perturbations. $\eta - \eta_{noise} = \pi a^2 / \Delta\Omega$ where **a** is given by :

$$u = u_0 + au_0 \cos(wt + \gamma)$$

where the second term on the right hand side describes the perturbation of the accelerating voltage u . There are [illegible] figures but there are 4 Soviet references.

SUBMITTED: November 1, 1957.

Card 2/2

SOV/56-34-3-18/55

AUTHORS: Orlov, Yu. F., Tarasov, Ye. K.

TITLE: The Damping of the Oscillations in a Cyclic Electron Accelerator (Zatukhaniya kolebaniy v elektronnom tsiklicheskom uskoritele)

PERIODICAL: Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, 1958, Vol. 34, Nr 3, pp. 651-657 (USSR)

ABSTRACT: The damping factors of radial and phase vibrations were determined taking into account the charge of the magnetic field along the trajectory. In the first paragraph the equations for the motion of the electron in a circular accelerator are derived. The equations so found for the phase vibrations in linear approximation and for the equations of the betatron vibrations are written down here explicitly. The second paragraph discusses the damping of free radial vibrations. The fluctuations p(t) of the radiation lead to an amplification of phase vibrations and because of the interrelation of the radial vibrations with the phase vibrations also to an amplification of the radial vibrations. The vertical vibrations are not connected directly with the phase vibrations. The interrelation of the vibrations

Card 1/3

The Damping of the Oscillations in a Cyclic Ele... SOV/56-34...8/55
Accelerator

leads to a redistributions of the damping intensities. It is shown here, that in an accelerator with hard focusing the parameters of the damping do not depend on the distribution of the quantity $n = (\rho_s/H_z)\,\partial H_z/\partial r$ along the trajectory. Then the authors obtain general formulae for the damping of the radial betatron and of the phase vibrations. The damping depends on the distribution of H_z along the trajectory. Further are also written down, for the forced oscillation of the phase. The frequencies of the betatron vibrations are always chosen so that on the trajectory a non-integer of vibrations can be spared. The authors here examine the case that the field in all magnets is equal. The third and last paragraph deals with the damping of the free phase vibrations and discusses the obtained results. The here obtained result have the following obvious meaning: An additional compression of the radial vibrations coincides with an additional amplification of the phase vibrations, i. e. the energy vibrations. For an amplification of the energy vibration it obviously is necessary that the increase of the energy of the particle is accompanied by a reduction of the emission. This takes place when at an increase of the energy the trajectory of the particle changes so that the mean value $\langle H^{\beta}\rangle \sim \langle \rho^{-\beta}\rangle$.

Card 2/3

The Damping of the Oscillations in a Cyclic Electron Accelerator SOV/ 56-34 -3-18/55

averaged over the new trajectory, decreases. Thereby H denotes the magnetic field strength and ρ the radius of curvature of the trajectory.
There are 6 references, 4 of which are Soviet.

SUBMITTED: September 6, 1957.

Card 3/3

9 (3), 24 (3) SOV/56-35-2-33/60

AUTHORS: Orlov, Yu. F., Kheyfets, S. A.

TITLE: The Depolarization of Electrons Because of the Radiation in a Magnetic Field (Depolyarizatsiya elektronov iz-za izlucheniya v magnitnom pole)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol 35, Nr 2 (8), pp 513-514 (USSR)

ABSTRACT: The change of the polarization of electrons (with initial longitudinal polarization) during their rotation in a magnetic field may be used for the measurement of the anomalous magnetic moment of the electron. Therefore it would be interesting to calculate the depolarization caused by the radiation in a magnetic field. A wave function for the calculation of the emission probability with an inversion of the spin direction in a homogenous magnetic field H is explicitly given. Expressions are then given for the intensity of the transition n, s = 0, A = 1, $0 \rightarrow n' = n - \nu$, s' = 0, A' = 0,1. The transitions with a change of the quantum number s make only an unimportant contribution to the total probability of the transition n, A = 1, $0 \rightarrow n' = n - \nu$, A' = 0,1. The emission with an

Card 1/2

The Depolarization of Electrons Because of the Radiation in a Magnetic Field

inversion of the spin direction has the order of magnitude $(\beta\nu/n)^2$ with respect to the total emission Therefore, the depolarization of the electrons, which is caused by radiation, is of extraordinarily low intensity. There are 4 references, 2 of which are Soviet

ASSOCIATION: Institut fiziki Akademii nauk Armyanskoy SSR (Physics Institute, AS Armyanskaya SSR)

SUBMITTED: April 10, 1958

Card 2/2

21 (9)
AUTHOR: Orlov, Yu. F.

SOV/56-35-2-40/60

TITLE: On the Mechanism of the Damping of Free Oscillations in a Cyclic Accelerator (O mekhanizme zatukhaniya svobodnykh kolebaniy v tsiklicheskom uskoritele)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958 Vol 35, Nr 2 (8), pp 525-527 (USSR)

ABSTRACT: Two previous papers assume that there is no radiation damping of the betatron oscillations in an electron accelerator. This paper demonstrates that the usual adiabatic damping and also radiation damping are caused by the rectification of the beam when it passes the accelerating intervals. The ring of the accelerator may contain an arbitrary number of short accelerating intervals. The influence of the accelerating interval may be described by a matrix. Calculations are discussed step by step. The considerations discussed in this paper confirm the correctness of the equations by Kolomenskiy (Ref 3) for the vertical and for the radial oscillations in an electron accelerator. However, the above-given mechanism of the damping cannot be applied to forced radial phase oscillations.

Card 1/2

On the Mechanism of the Damping of Free Oscillations in a Cyclic Accelerator

SOV/56-35-2-40/60

The mechanism of the damping of synchrotron oscillations is quite different. Above all, radiation immediately damps the phase oscillations since the intensity of the radiation is proportional to E^2. (E denotes the total energy of the particle). The coupling of the radial and phase vibrations changes the distribution of the damping decrements. The most advantageous manner of damping the radial oscillations is evidently the variation of the magnetic field along the orbit. There are 6 references, 4 of which are Soviet.

ASSOCIATION: Institut fiziki Akademii nauk Armyanskoy SSR (Physics Institute, AS Armyanskaya SSR)

SUBMITTED: May 8, 1958

Card 2/2

SOV/120-59-1-2/50

AUTHORS: Orlov, Yu. F., Tarasov, Ye. K., Kheyfets, S. A.

TITLE: The Damping of Particle Oscillations in an Electron Synchrotron with Strong Focussing (Dempfirovaniye kolebaniy chastits v elektronnom sinkhrotrone s zhestkoy fokusirovkoy)

PERIODICAL: Pribory i tekhnika eksperimenta, 1959, Nr 1, pp 17-20 (USSR)

ABSTRACT: It was shown in Ref.1 that radiation may lead to an instability of radial oscillations in an electron accelerator with strong focussing. By varying the magnetic field in high gradient magnets, stability may be achieved for all degrees of freedom (Ref.2). In Refs.2 and 3 formulae were given for the damping coefficients. By varying the field along the orbit these coefficients may be chosen so that during the process of acceleration particle losses are a minimum. The theory of losses due to radiation fluctuations is given in Ref.4. Using the results obtained in the above papers, a brief discussion is given of methods of damping of the oscillations by varying the magnetic field along the orbit. Among the possibilities considered are resonance damping,

Card 1/2

The Damping of Particle Oscillations in an Electron Synchrotron with Strong Focussing

complex structures in the intervals between usual magnets (Ref.5), and reduction of the field in magnets with radial focussing. There are 1 figure and 5 references, of which 4 are Soviet and 1 is English.

ASSOCIATION: Fizicheskiy institut AN ArmSSR (Physical Institute, Academy of Sciences of the Armenian SSR)

SUBMITTED: November 21, 1957.

SOV/120-59-1-3/50

AUTHORS: Orlov, Yu. F., Kheyfets, S. A.

TITLE: Distortion of the Magnetic Field by a Metallic Vacuum Chamber in a Strongly Focussing Accelerator (Iskazheniye magnitnogo polya metallicheskoy vakuumnoy kameroy v sil'nofokusiruyushchem uskoritele)

PERIODICAL: Pribory i tekhnika eksperimenta, 1959, Nr 1, pp 21-23 (USSR)

ABSTRACT: The effect of the metallic vacuum chamber on the magnetic field and gradient in a strongly focussing accelerator is of major importance. Experimental work carried out in this direction (Ref.1) gives the right order of magnitude for these distortions but unfortunately, cannot give a correct picture of the field. Normally, the search coils used in such experimental work are so large that only measurements near the centre of the chamber are possible. Furthermore, such measurements depend on the particular magnet employed and therefore have only special value and do not apply in general. The present note derives expressions for the magnetic field inside a metallic vacuum chamber having an

Card 1/2

SOV/120-59-1-3/50

Distortion of the Magnetic Field by a Metallic Vacuum Chamber in a Strongly Focussing Accelerator

elliptical or a rectangular cross section. At high repetition frequencies eddy current heating of the chamber takes place and this effect is also briefly considered. There are 2 figures and 1 Soviet reference.

ASSOCIATION: Fizicheskiy institut AN ArmSSR (Physics Institute, Academy of Sciences, Armenian SSR)

SUBMITTED: November 1, 1957.

Card 2/2

SOV/120-59-2-2/50

AUTHOR: Orlov, Yu.F.

TITLE: ~~Use of Quadratic~~ Nonlinearities in a Strong-Focussing Accelerator (Primeneniye kvadratichnoy nelineynosti v uskoritele s zhestkoy fokusirovkoy)

PERIODICAL: Pribory i tekhnika eksperimenta, 1959, Nr 2, pp 8-11 (USSR)

ABSTRACT: It is shown from theory that the dependence of the betatron frequency on the momentum can be reduced if quadratic nonlinearities are used, and that troublesome synchrobetatron resonances can be eliminated. These latter resonances are considered in the first section; they occur when the ratio of the amplitude beat frequency to the synchrotron frequency is an integer. An electron accererator is envisaged; Eq (1) gives the basic relationships. The beat frequency is given in terms of the parameters by Eq (2). Then Eq (3) gives the increase in the amplitude of the betatron oscillations caused by passing through a resonance; Eq (4) is the same for the complete acceleration cycle. The second section quotes Eqs (5) and (6) from an earlier publication by the same author; these equations define the betatron oscillation frequencies when a quadratic nonlinearity is present.

Card 1/2

Use of Quadratic Nonlinearities in a Strong-Focussing Accelerator

Eqs (7) and (8) are the conditions for these frequencies to be zero. Eqs (9) and (10) define the quantity $(\partial^2 H/\partial r^2)/H\rho$ for the magnets that focus in r and z respectively. The third section is a straight quotation without explanation, from Ref 5; A_r and A_z are the amplitudes of the betatron oscillations. Some conditions under which the formulae are not applicable are indicated. There are 1 table and 7 references, of which 6 are Soviet and 1 Italian.

Card 2/2

ASSOCIATION: Fizicheskiy institut AN Arm SSR (Physics Institute, Academy of Sciences of the Arm. SSR)

SUBMITTED: February 6, 1958

82588
S/022/60/013/01/10/010
C 111/ C 333

24.2300

AUTHORS: Orlov, Yu. F., Kheyfets, S. A.

TITLE: Depolarization of the Bundle Under Motion in an Inhomogeneous Magnetic Field

PERIODICAL: Izvestiya Akademii nauk Armyanskoy SSR. Seriya fiziko-matematicheskikh nauk, 1960, Vol. 13, No. 1, pp. 169-171

TEXT: For the measurement of the magnetic moment of an electron one can use the variation of polarization of the particle which occurs under rotation of the particle in a magnetic field. If the field is inhomogeneous, then a depolarization of the bundle takes place. If the magnetic field is given by

$$(3) \qquad H = H_0\left(1 - n\frac{r}{\varrho} + m\frac{r^2}{\varrho^2} + \ldots\right),$$

where n and m describe the values of the gradient and of the second derivative of the field, then for the period of the particle it holds

$$(4) \qquad T = T_0\left(1 + \frac{2m - n - n^2}{2(1-n)} \cdot \frac{\bar{r}^2 - \bar{z}^2}{\varrho^2}\right).$$

Card 1/2

82588

S/022/60/013/01/10/010
C 111/ C 333

Depolarization of the Bundle Under Motion in an Inhomogeneous Magnetic Field

The dispersion of angles resulting from the oscillations of the particles is then

$$(5)\quad \Delta\Psi' = 2\pi \frac{\Delta\mu}{\mu} \frac{E}{mc^2} \frac{2m - n - n^2}{2(1-n)} \frac{\bar{r}^2 - \bar{z}^2}{\varrho^2} \frac{t}{T_0},$$

where $\frac{\Delta\mu}{\mu}$ is the relative deviation of the magnetic moment from the Dirac value.

There are 2 non-Soviet references: 1 Italian and 1 American.

ASSOCIATION: Fizicheskiy institut AN Armyanskoy SSR (Physical Institute AS Armyanskaya SSR).

SUBMITTED: June 28, 1959

Card 2/2

S/058/63/000/001/023/120
A062/A101

AUTHOR: Orlov, Yu. F., Kheyfets, S. A.

TITLE: Calculation of parameters of a strong focusing accelerator taking into account the stray fields

PERIODICAL: Referativnyy zhurnal, Fizika, no. 1, 1963, 42, abstract 1A404 (In collection: "Elektron. uskoriteli". Tomsk, Tomskiy un-t, 1961, 145 - 148)

TEXT: Calculation of a strong focusing accelerator with a real magnetic field (taking into account the stray fields) is mathematically complicated. Therefore one proceeds by first determining "ideal" accelerator parameters which have then to be recalculated more precisely in conformity with the results of magnetic measurements. For such a recalculation it is suggested to use the perturbation theory by considering the deviations of the field and its gradient from the "ideal" values as small. With the thus improved accuracy the accelerator parameters satisfy the invariability condition of the betatron oscillation frequencies and of the equilibrium orbit. The equations obtained from this condition can

Card 1/2

S/058/63/000/001/023/120
A062/A101

Calculation of parameters of...

be satisfied by a suitable choice of the field index n and of the lengths of the rectilinear gaps and magnetic sectors.

A. Fateyev

[Abstracter's note: Complete translation]

Card 2/2

24.6730

25029

S/057/61/031/007/010/021
B104/B206

AUTHORS: Kheyfets, S. A., Orlov, Yu. F., and Gendzhoyan, G. V.

TITLE: Particle losses in an electron accelerator resulting from quantum fluctuations of radiation (phase oscillations)

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 31, no. 7, 1961, 824-829

TEXT: The magnetic field of an annular electron accelerator is usually changed according to the relation $H \sim H_0(1-\cos \omega t)$. Orlov et al. (PTE, no. 5, 17, 1958) showed that for $|\cos \omega t| < 5/6$ and $H < 1.8\ H_0$, the mean square amplitude of the phase oscillations may be described by

$$\overline{A^2} = BF_\beta(\zeta), \qquad (1)$$

$$F_\beta(\zeta) = \zeta^{-1/6}(1+\zeta)^{-1/2} e^{-(1+\beta)\zeta} \int_0^\zeta (1+u)^{-1/2} u^{1/6} e^{(1+\beta)u} du, \qquad (2).$$

Card 1/6

$\zeta = P_r/\dot{\mathcal{E}} = \Delta\mathcal{E}_{rad}/U$ is the relation of the emission intensity of electrons in a magnetic field with the energy increment $\dot{\mathcal{E}}$. ζ increases quickly with increasing particle energy. The parameter β depends on the coupling of radial- and phase oscillations, and determines radiation attenuation. In strongly focusing accelerators $\beta = 0$; in weakly focusing ones, $\beta = -\{4(1-n)\}^{-1}$. If in a strongly focusing accelerator, a variation of the magnetic field along the orbits is used to attenuate the radial oscillations, the radiation attenuation can be described by the decrements

$$\gamma_\Phi \simeq 4(1+\beta)\frac{P_\gamma}{\mathcal{E}}; \quad \int_0^t \gamma_\Phi dt' \simeq (1+\beta)\zeta, \tag{3}$$

$$A^2 = A_0^2 \exp\left(-\int_0^t \gamma_\Phi dt'\right). \tag{4}$$

Card 2/6

The parameter B is then

$$B = 0.84 q \alpha_{3} \sigma_{2} L^{-1/4} \left(\frac{mc^2}{U}\right)^{1/4} \left(\frac{R}{L}\right)^{1/8}, \qquad (5),$$

where L and R are length and curvature radius of the orbit in meters, $\sigma_2 = \left\langle \frac{H^2}{H_0^2} \right\rangle$, $\sigma_3 = \left\langle \frac{|H|^3}{H_0^3} \right\rangle$, q the multiplicity of the frequency of the acceleration voltage, α the logarithmic differential quotient of the orbit length with respect to the pulse, Φ_s the equilibrium phase (with $\Phi = 0$, the voltage of the acceleration field attains a maximum). If the oscillations can be assumed as linear, the kinetic equation for the distribution function of the amplitudes, which takes account of the stochastic oscillations as well as the attenuation of the oscillation, may be brought into the form of the equations

$$\frac{\partial \Phi}{\partial x} = \frac{\partial}{\partial z}\left(z \frac{\partial \Phi}{\partial z} + z\Phi\right), \qquad (6)$$

where

$$z=\frac{a}{\tau+1},\quad dx=\frac{d\tau}{\tau+1}, \tag{7}$$

$$a=\frac{A^2}{A^2_{\text{kom.}}}\exp\int_0^t\gamma dt';\quad \tau=\frac{A^2}{A^2_{\text{kom.}}}\exp\int_0^t\gamma dt' \tag{8}.$$

If $A_{\text{permissible}}$ is the maximum permissible oscillation amplitude, $A^2_{\text{permissible}}=\dot{\Phi}^2_{\text{permissible}}=\dot{\Phi}^2/\Omega^2$ (where Ω is the frequency of the phase) holds for linear phase oscillations. If $\ddot{\Phi}=C(\cos\Phi_s-\cos\Phi)$ holds for nonlinear phase oscillations, $A^2_{\text{permissible}}=4(1-\Phi_s\cot\Phi_s)$ may be written down approximately. For the number of particles participating in the acceleration up to the "moment" $\zeta\sim 1$, formula

$$n(\zeta)\simeq n(0)\exp\left\{-(1+\beta)\int_\zeta^\zeta\frac{A^2_{\text{kom.}}}{A^2}\exp\left(-\frac{A^2_{\text{kom.}}}{A^2}\right)d\zeta\right\}. \tag{14}$$

Card 4/6

is given which agrees with that by K. B. Robinzon (Intern. Conf. on High-Energy Accel. a. Instr., CERN, p. 293, 1959). Calculation results for $n(\zeta)$, which were made at the Computer Center of the AS Armyanskaya SSR by means of (14), are shown in some diagrams. It may be seen that the quantum-oscillations due to emission begins at $\zeta > 1$ and that the approximation formula

$$n(\zeta) = n(0) \exp\left\{\int_0^{\pi(0} a_0(x')\,dx'\right\}, \qquad (11)$$

can be used for $B_1 \ll 0.3$. The losses strongly depend on B_1 and β. The

authors thank the collaborators of the Computer Center, R. A. Aleksandryan, T. M. Ter-Mikayelyan and A. G. Piliposyan for their assistance. There are 7 figures and 11 references: 7 Soviet-bloc and 4 non-Soviet-bloc.

ASSOCIATION: Fizicheskiy institut AN Arm. SSR (Physics Institute, AS Armyanskaya SSR). Vychislitel'nyy tsentr AN Arm. SSR (Com-

Particle losses in an electron ... S/057/61/031/007/010/021
B104/B206

puter Center, AS Armyanskaya SSR)

SUBMITTED: August 31, 1960

Card 6/6

S/081/62/000/011/024/057
E071/E192

AUTHORS: Shvedov, V.P., Rosyanov, S.P., and Orlov, Yu.F.

TITLE: Determination of the products of radiolysis of triphenylphosphate

PERIODICAL: Referativnyy zhurnal, Khimiya, no.11, 1962, 283, abstract 11 Zh 350. (Tr. Leningr. tekhnol. in-ta im. Lensoveta, no.55, 1961, 59-63).

TEXT: Using ultraviolet spectroscopy and paper chromatography it was shown that radiolysis of crystalline triphenylphosphate (I) by γ-rays of Co^{60} (1200 curie) in the presence of air, yields substances similar to mono- and di-phenylphosphoric acids, as well as an easily hydrolised substance, the spectrum of which in 0.05N NaOH has maxima at 235 and 287 mμ. The formation of these substances is ascribed to the appearance of free radicals on irradiation of (I). The total yield of phosphorus containing radiolysis products amounts to 0.77 mole/100 ev of the energy absorbed at an irradiation dose of 3.5×10^{21} ev/g, which indicates a high stability of (I) to γ-irradiation in comparison

Card 1/2

Determination of the products of ... S/081/62/000/011/024/057
E071/E192

with that of trialkylphosphates. The ultraviolet spectra of (I) and its radiolysis products are given.

[Abstractor's note: Complete translation.]

Card 2/2

S/057/62/032/008/003/015
B104/B102

AUTHORS: Orlov, Yu. F., and Kheyfets, S. A.

TITLE: Particle losses due to multiple Coulomb scattering in a cyclic accelerator

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 32, no. 8, 1962, 919 - 923

TEXT: The mean square amplitude of the betatron oscillations produced by multiple Coulomb scattering is

$$A^2 = \frac{B}{\sqrt{x^2-1}}\left(\operatorname{arch} x - \operatorname{arch} x_0 - \frac{x}{\sqrt{x^2-1}} + \frac{x_0}{\sqrt{x_0^2-1}}\right), \quad (12)$$

$$B = \frac{4|\Phi|^2_{max}\overline{|\Phi|^2}}{\pi w^3 A^2_{acc.}} \frac{NL^3}{M^2V}\frac{(Ze^2)^2}{mc^4} L \quad (13)$$

$$2iw = \Phi^* \frac{d\Phi}{d\theta} - \Phi\frac{d\Phi^*}{d\theta}, \quad (14)$$

where $\mathcal{E}$ is the total particle energy, $\mathcal{E}_{inj}$ the injection energy, L the orbit length, Φ a Floke's function describing the betatron oscillations,

Card 1/2

S/057/62/032/008/003/015
B104/B102

Particle losses due to...

$x = \mathcal{E}/mc^2$, $x_o = \mathcal{E}_{inj}/mc^2$, M is the number of periods of the magnetic system, θ an angle varying by 2π over the length $l = L/M$ and V is the increase in the particle energy per revolution. It is shown that the number n of the remaining particles is a function of a_{max} and $D = \overline{A^2_{max}}/A^2_{all}$ where A_{all} is the distance between the center of the rectangular vacuum chamber and the admissible boundary of oscillations and $a_{max} = \sqrt{(x^2-1)/(x_o^2-1)}$. Scattering decreases as a_{max} increases, i.e. as the particle energy increases, and n has a plateau on which the number of the remaining particles depends on D only. This is confirmed by exact calculations of the Fokker-Plank equation $\partial f/\partial \tau = \frac{\partial}{\partial a} a \frac{\partial f}{\partial a}$ where f is the particle distribution function. With nonrelativistic and ultrarelativistic injection energies the n(D) curves are obtained for the particle energy losses in a cyclic accelerator. There are 3 figures.

SUBMITTED: August 23, 1961

Card 2/2

S/056/62/043/004/027/061
B108/B186

AUTHOR: Orlov, Yu. F.

TITLE: Stable betatron oscillations in a nonlinear magnetic field

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 43, no. 4(10), 1962, 1308 - 1314

TEXT: Betatron oscillations in an axisymmetric magnetic field with a maximum or a minimum on the radius are considered. The potential well arising in this case has energy levels $U + \frac{1}{2}(dr/d\tau)^2$ corresponding to stable z-oscillations. This is due to the accelerated particle passing through regions in which the gradient $\partial H_z/\partial r$ has different signs, varying with a period $\frac{2\pi}{\Omega}$. The z-oscillations are stable if the criterion $\cos 2\pi\mu_z' < 1$ is fulfilled. μ_z is the number of z-oscillations per one Ω. When the z-oscillations are small, a slight nonlinearity (order of z^2) does not interfere seriously with stability. This is also evident in

Card 1/2

Stable betatron oscillations... S/056/62/043/004/027/061
B108/B186

practical focusing where z^2 nonlinearities occur. Strong focusing is possible in the initial phase of acceleration. There are 2 figures.

ASSOCIATION: Institut fiziki Akademii nauk Armyanskoy SSR (Physics Institute of the Academy of Sciences of the Armyanskaya SSR)

SUBMITTED: March 15, 1962

Card 2/2

ACCESSION NR: AT4014037 S/2918/63/000/000/0508/0526

AUTHOR: Orlov, Yu. F.

TITLE: Theory of nonlinear-focusing accelerators for high energies

SOURCE: AN ArmSSR. Fizicheskiy institut. Voprosy* fiziki elementarny*kh chastits, 1963, 508-526

TOPIC TAGS: accelerator, nonlinear focusing accelerator, phase volume, automatic phase stability, clashing beam, proton beam, antiproton beam, magnet size, magnet tolerances

ABSTRACT: This lecture is essentially a continuation of one delivered a year before at the Nor-Amberd School of Physicists. It is pointed out that there is still no engineering design for nonlinear-focusing accelerators and that possibly new theoretical problems will arise during the course of their development. The main purpose of nonlinear-focusing accelerators is to produce very large

Card 1/3

ACCESSION NR: AT4014037

phase volumes so as to capture in the acceleration mode a number of particles that is two or three orders of magnitude larger than in strong-focusing accelerators with comparable dimensions, and to use a time-invariant magnetic field so as to increase the repetition frequency of the acceleration cycles. The theory that leads to very large phase volumes is developed. The mechanism of transverse automatic phase stability of particle motion, whereby the resonant buildup of nonlinear oscillations is suppressed with the aid of a transverse (electric or magnetic) field, is discussed. The effect of different perturbations is evaluated and it is shown that in nonlinear focusing the particle loss does not change much in comparison with other methods. The use of clashing beams of protons and antiprotons in nonlinear focusing is briefly treated, and it is shown that in such a case nonlinear focusing can increase the permissible phase volume by 10^4. It is concluded that nonlinear focusing will offer definite advantages at very high energies, in spite of the much more stringent tolerances required with respect to the

ACCESSION NR: AT4014037

magnet dimensions, alignment, and constancy of the magnetic field. Orig. art. has: 7 figures and 42 formulas.

ASSOCIATION: Fizicheskiy institut AN ArmSSR (Physics Institute, AN ArmSSR)

SUBMITTED: 00	DATE ACQ: 20Feb64	ENCL: 00
SUB CODE: PH	NO REF SOV: 002	OTHER: 000

Card 3/3

L 15523-63 EWT(1)/EWT(m)/BDS AFFTC/ASD GG

ACCESSION NR: AP3005263 S/0056/63/045/002/0173/0176

56

AUTHORS: Simonyan, Kh. A.; Orlov, Yu. F.

TITLE: Anomalous resonance spin flip of a particle in a magnetic field

SOURCE: Zhur. eksper. i teoret. fiz., v. 45, no. 2, 1963, 173-176

TOPIC TAGS: spin flip, anomalous precession frequency, magnetic moment, electron, muon

ABSTRACT: It is shown that resonance spin slip can be induced in a particle rotating in a constant magnetic field by a weak high-frequency radial or azimuthal magnetic field of frequency equal to the anomalous part of the spin-precession frequency. Resonance slip flip is of interest because it can increase by some 700 times the accuracy with which the magnetic moments of electrons and muons can be measured by the high-frequency method, and the author shows that the perturbation frequency need not be equal to the entire precession frequency, but only to its anomalous part. Orig. art. has: 14 formulas.

ASSOCIATION: Fizicheskiy institut GKAE, Yerevan (Physics Inst. State Atomic Energy Comm.)

SUBMITTED: 13Dec62 DATE ACQ: 06Sep63 ENCL: 00

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

Card 1/1

ORLOV, Yu.F.

[redacted] of a charged particle in a helical cubic straight magnetic field. Zhur. eksp. i teor. fiz. 45 no.4:932-935 O '63. (MIRA 16:11)

KHEYFETS, S.A.; ORLOV, Yu.F.

Theory of radiative damping of radial oscillations of an electron in a magnetic field. Zhur. eksp. i teor. fiz. 45 no.4:1225-1229 O '63. (MIRA 16:11)

1. Fizicheskiy institut Gosudarstvennogo komiteta po ispol'zovaniyu atomnoy energii SSSR, Yerevan.

L 12655-63 EWT(1)/BDS/ES(w)-2 AFFTC/AFWL/ASD/SSD Pi-4/Pab-4

ACCESSION NR: AP3003553 S/0020/63/151/002/0318/0319

AUTHORS: Orlov, Yu. F.; Kheifets, S. A.

TITLE: Radiation damping of free oscillations

SOURCE: AN SSSR. Doklady, v. 151, no. 2, 1963, 318-319

TOPIC TAGS: radiation damping, magnetic field electron, quantum mechanics, Schroedinger equation

ABSTRACT: The damping of free oscillations of an electron in a non-uniform magnetic field was quantum-mechanically calculated for the non-relativistic case. The movements of the electron are assumed to be confined to a plane; the magnetic field having a small uniformity. The electron spin is disregarded in the Schroedinger equation. The results of the calculation show that there is no difference between radiation-damping calculated classically and quantum-mechanically. This report was presented by Academician V. I. Veksler on 18 Feb 63. Orig. art. has: 12 equations.

ASSOCIATION: none

SUBMITTED: 29 Jan 63 DATE ACQ: 30 Jul 63 ENCL: 00

SUB CODE: PH NO REF SOV: 004 OTHER: 000

Card 1/1

L 4432b-65 EWT(m)/EPA(w)-2/EWA(m)-2 Pab-10/Pt-7 IJP(c) GS
ACCESSION NR: AT5007916 S/0000/64/000/000/0090/0096

37
36
B71

AUTHOR: Orlov, Yu. F.

TITLE: Nonlinear focusing accelerators and systems with colliding beams

SOURCE: International Conference on High Energy Accelerators. Dubna, 1963. Trudy. Moscow, Atomizdat, 1964, 90-96

TOPIC TAGS: high energy accelerator, particle acceleration, particle optics, particle trajectory, magnetic lens

ABSTRACT: Present-day understanding of nonlinear focusing, the present report shows, is sufficiently broad to propose alternate versions of nonlinear focusing accelerators that operate concurrently with strong focusing accelerators. An essential step forward compared with earlier elementary ideas was the present author's realization that autophasing of nonlinear oscillations (which was investigated for its application to betatron oscillations first by B. V. Chirikov

Novmber, 1963). The author considers the two alternatives of synchrotron and

Card 1/2

L 44324-65
ACCESSION NR: AT5007916

phasotron with nonlinear focusing, since this idea can be realized in a number of different ways. In the evaluation of the possibilities of nonlinear focusing, the very strong dependence of the quantitative characteristics of motion upon the form of the magnetic field is important. The proposed alternatives are admittedly still not the optimum ones. The nonlinear focusing synchrotron is considered in two alternative forms: horizontal (the r-oscillations are large nonlinear ones) and vertical (z-oscillations are nonlinear ones). Of greatest interest here is the nonlinear focusing phasotron for utilizing time-constant field, i.e. for realizing a ring-phasotron with nonlinear focusing, which results in the possible creation of colliding beams, and consequent higher interaction energies. The author claims

by an alternative with constant magnetic field and sections describable by a unit matrix. Orig. art. has 5 figures, 20 formulas.

ASSOCIATION: Fizicheskiy institut GKAE SSSR (Physics Institute, GKAE SSSR)

SUBMITTED: 26May64 ENCL: 00 SUB CODE: NP

NO REF SOV: 004 OTHER: 000

Card 2/2

L 29295-66 EWT(l)/EWT(m) LIP(c) AT/GD

ACC NR: AT6012262 SOURCE CODE: UR/0000/65/000/000/0001/0006

AUTHORS: Bayer, V. N.; Orlov, Yu. F.

56
B+1

ORG: Institute of Nuclear Physics, Siberian Department AN SSSR (Institut yadernoy fiziki Sibirskogo otdeleniya AN SSSR)

TITLE: Quantum depolarization of electrons in a magnetic field

SOURCE: AN SSSR. Sibirskoye otdeleniye. Institut yadernoy fiziki. Doklady, 1965. Kvantovaya depolyarizatsiya elektronov v magnitnom pole, 1-6

TOPIC TAGS: depolarization, electron polarization, quantum resonance phenomenon, transverse magnetic field, circular accelerator.

ABSTRACT: The authors show by theoretical calculation that the polarization of electrons and positrons which they acquire in storage rings may be lost not only as a result of depolarizing resonances due to the radial and azimuthal components of the magnetic field on the particle trajectory, but also under the influence of the quantum character of the radiation. The quantum depolarization, like the resonance depolarization, is also realized only in the presence of perturbing radial and azimuthal components of the magnetic field, but the satisfaction of resonance conditions is not essential in the quantum case. The resonance

Card 1/2

L 29295-66

ACC NR: AT6012262

required for the depolarization is produced in the quantum case by the Fourier components of the energy jumps connected with the quantum character of the radiation. Although this quantum depolarization, unlike the resonance depolarization, cannot be reduced by suitable choice of the particle energy, it can be reduced by minimizing the magnetic-field perturbations. Estimates for typical storage ring parameters show that the possible depolarization time (in the case of a 6 Bev storage ring with field 8×10^3 Oe) can reach 25 seconds as against a polarization time of 190 seconds. Orig. art. has: 18 formulas.

SUB CODE: 20/ ORIG REF: 001/ OTH REF: 001

Card 2/2

SHVEDOV, V.P.; ORLOV, Yu.F.

Extraction of nitric acid by phosphate and phosphonate derivatives. Zhur.neorg.khim. 10 no.12:2774-2779 D '65. (MIRA 19:1)

L 27759-66 EWT(m)/EWP(j) RM

ACC NR: AP6018510 SOURCE CODE: UR/0079/65/035/011/2046/2050

30
49
B

AUTHOR: Orlov, Yu. F.; Ionin, B. I.; Shvedov, V. P.

ORG: Leningrad Technological Institute im. Lensovet (Leningradskiy tekhnologicheskiy institut)

TITLE: Extraction properties of phosphinic acid esters

SOURCE: Zhurnal obshchey khimii, v. 35, no. 11, 1965, 2046-2050

TOPIC TAGS: phosphinic acid, alkyl radical, IR spectrum, electron density, organic phosphorus compound, cerium compound

ABSTRACT: The extraction of trivalent cerium nitrate by esters of phosphinic acids with alkyl radicals, radicals with multiple bonds and functional groups was investigated. The butyl esters of propylphosphinic, 3-oxobutylphosphinic, allylphosphinic, methylacetylphosphinic, and 1,2-di(carbethoxy)ethylphosphinic acids, as well as the diisoamyl ester of methylphosphinic acid were studied as extraction reagents. The extraction ability of phosphonates was found to be determined chiefly by the inductive effect of the substituents. The presence of acceptor groups in the radical greatly reduces the extraction constant. Of the compounds investigated, the maximum extraction ability was possessed by the diisoamyl ester of methylphosphinic acid, which the authors explain by a

Card 1/2

UDC: 542.61:547.26'118:546.655

L 27759-66

ACC NR: AP6018510

hyperconjugation effect between the methyl and phosphoryl groups, leading to an increase in the electron density on the oxygen in the case of this ester. No strict correlation was detected between the extraction constants and frequencies of the P=O groups in the infrared spectra of the compounds, indicating that such physical data as infrared spectra or dipole moments should be used in evaluating the extraction abilities of organophosphorus compounds only for series of similar compounds. No appreciable interaction of the carbonyl, carbethoxyl, and unsaturated groups with cerium nitrate was detected. The authors thank K. S. Mingaleva for measuring the dipole moments. Orig. art. has: 2 figures, 1 table and 2 formulas. [JPRS]

SUB CODE: 07,20 / SUBM DATE: 03Jul64 / ORIG REF: 010 / OTH REF: 002

Card 2/2

L 14850-66 EWT(1) IJP(c) AT

ACC NR: AP6001721 SOURCE CODE: UR/0020/65/165/004/0783/0785

AUTHOR: Bayer, V. N.; Orlov, Yu. F.

ORG: Novosibirsk State University (Novosibirskiy gosudarstvennyy universitet) 22 B

TITLE: Quantum depolarization of electrons in a magnetic field

SOURCE: AN SSSR. Doklady, v. 165, no. 4, 1965, 783-785

TOPIC TAGS: depolarization, cyclic acceleration, electron polarization

ABSTRACT: The authors show that depolarization of electrons and positrons in modern storage rings can be caused not only by resonance due to radial and azimuthal components of the magnetic field on the particle trajectories, but also by the quantum nature of the radiation. The latter depolarization occurs also only in the presence of perturbing radial and azimuthal field components, but is produced by harmonics which cannot be eliminated by suitable choice of the energy. Calculations show that the effect depends very strongly on the particle energy and on the number of closest harmonic of the radiation, the distance between the harmonic and the resonance, and on the vertical displacement of the particle in the orbit. It is shown by way of an example that in a typical storage ring the characteristic depolarization time is one order of magnitude lower than the polarization time, so that in this case the beam can become readily depolarized unless special measures are adopted to maintain the beam polarization. This report was presented by Academician G. I. Budker. Orig. art. has: 17 formulas.

SUB CODE: 20/ SUBM DATE: 05Apr65/ ORIG REF: 001/ OTH REF: 001

UDC: 539.121.85

Card 1/1 BC

L 22413-66 EWT(m) IJP(c)
ACC NR: AP6007944 SOURCE CODE: UR/0089/66/020/002/0112/0117

AUTHORS: Vecheslavov, V. V.; Orlov, Yu. F. 29 B

ORG: none

TITLE: Main properties of nonlinear focusing

SOURCE: Atomnaya energiya, v. 20, no. 2, 1966, 112-117

TOPIC TAGS: focusing accelerator, 19 motion stability, radial acceleration, particle acceleration, phase equilibrium

ABSTRACT: The main purpose of the paper is to confirm the existence of external phase stabilization under cosinusoidal perturbations. Another purpose of the study was to show that phase stabilization actually leads to conservation of stability of motion when adiabatic damping is taken into account, and to confirm the existence of mutual phase stabilization of the r-z oscillations which occur in the absence of an external perturbation near the r-z oscillation resonance. To this end, the authors consider a simple model of nonlinear focusing, which has no special practical significance, but makes it possible, 2

Card 1/2 UDC: 621.384.60

L 22413-66

ACC NR: AP6007944

because of its simplicity, to carry out a sufficiently complete analysis of all the main properties of nonlinear focusing. In this model a symmetrical magnetic field is used whose series expansion contains r and z powers not higher than the fifth. The simple model has even in the first approximation a perturbation theory one r-z resonance in the center of its stability region. The dimensions of the first region of stability are evaluated with allowance for small z-oscillations. It is established that mutual phase stabilization occurs in the region of the r-z resonance. A numerical and partially analytic investigation of these effects is briefly presented. The calculations of the simple model confirm the main concepts of the theory. Orig. art. has: 4 figures and 23 formulas.

SUB CODE: 20/ SUBM DATE: 23Jul65/ ORIG REF: 003/

Card 2/2 fkw

L 39083-66 EWT(m)/EWP(j)/EWP(t)/ETI IJP(c) RM/JD/JC

ACC NR: AP6022874 SOURCE CODE: UR/0186/66/008/002/0139/0145

AUTHOR: Orlov, Yu. F.; Shvedov, V. P.

ORG: none

TITLE: Effect of the composition of organophosphorus compounds on the extraction of cerous nitrate

SOURCE: Radiokhimiya, v. 8, no. 2, 1966, 139-145

TOPIC TAGS: organic phosphorus compound, extraction, cerium compound

ABSTRACT: The object of the work was to obtain quantitative data on the extraction of cerous nitrate with fifteen organophosphorus compounds of various structures. The distribution of Ce^{144} was studied without adding a carrier under equilibrium conditions at 25°C, with benzene as the diluent. The distribution coefficients of cerium were determined by measuring the activity of both phases. It is shown that in the extraction of cerium (III) by phosphates and phosphonates, the inductive effect of the substituents is of decisive importance. In many cases, however, steric factors have a substantial influence. It was found that the relation between log K (K being the extraction constant of Ce(III)) and the frequency of vibrations of the P=O bond of the extractants is only very roughly linear. Orig. art. has: 7 figures and 1 table.

SUB CODE: 07/ SUBM DATE: 14Dec64/ ORIG REF: 011/ OTH REF: 008

Card 1/1 UDC: 542.61:541.6

ACC NR: AR6019853 SOURCE CODE: UR/0398/66/000/001/A007/A008

AUTHOR: Orlov, Yu. F.

TITLE: Approximate calculation of hydrofoil lift near the glide plate

SOURCE: Ref. zh. Vodnyy transport, Abs. 1A31

REF SOURCE: Tr. Gor'kovsk. in-ta inzh. vodn. transp., vyp. 63, 1965, 64-77

TOPIC TAGS: hydrofoil, shipbuilding engineering, vortex flow, turbulent flow, applied mathematics

ABSTRACT: The assumption is made that the dihedral angle of the plate and of the V-shaped foil is small. The plane section hypothesis is accepted. The case of foil movement near a plate when speed is high is considered. The supporting foil is replaced by a system of vortices consisting of a connected vortex extending along the foil span, and of a system of free, semiinfinite vortices forming a turbulent shroud. A formula for use in determining the angle of inductive taper for the flow at any point on the supporting foil is obtained. The basic integro-differential equation for determining circulation for foil speed near the glide plate is derived. The solution to the equation obtained yields the span circulation distribution in the first approximation. Second approximation calculations determine the effect of the foil on the magnitude of plate circulation. The lift coefficient value is found

Card 1/2 UDC: 629.12:532

ACC NR: AR6019853

from span circulation distribution. The solution obtained was in satisfactory agreement with the experiment. 5 illustrations. Bibliography of 5 titles. [Translation of abstract]

SUB CODE: 13,20

Card 2/2

ACC NR: AR6024059 (N) SOURCE CODE: UR/0124/66/000/004/B067/B067

AUTHOR: Orlov, Yu. F.

TITLE: Approximate calculation of the lift of an airfoil close to a planing plate

SOURCE: Ref. zh. Mekhanika, Abs. 4B454

REF SOURCE: Tr. Gor'kovsk. in-ta inzh. vodn. transp., vyp. 63, 1965, 64-77

TOPIC TAGS: incompressible flow, potential flow, airfoil, integrodifferential equation, aerodynamic lift

ABSTRACT: Steady flow around an airfoil of finite span under a planing plate by a potential flow of a heavy ideal incompressible fluid is examined. The airfoil and planing plate are approximately represented in the form of three eddy systems: the second to the planing plate; and the third to a fictitious airfoil by means of which the influence of a free surface is taken into account. Here it is assumed that the flow occurs at high Froude numbers so that the effect of ponderability can be disregarded. The author, limiting himself to the linear dependence of the coefficient of lift of the airfoil and the angle of attack and using the hypothesis of plane sections, constructs an integrodifferential equation for the distribution of circulation over the span of the airfoil, while taking into account downwash from all three eddy systems. This equation is solved by successive approximations after Multhopp's method on the assumption that downwash for the airfoil from the plate is determined only by

UDC: 629.12:532

Card 1/2

ACC NR: AR6024059

its lift, i.e., the effect of the airfoil on the plate is disregarded. Having determined the distribution of circulation over the wing corresponding to this case, one can find the downwash and the corresponding distribution of circulation over the airfoil in the second approximation. The article has one graph with calculated curves and experimental data showing the satisfactory agreement of the experiment and theoretical calculations. [Translation of abstract] Bibliography of 5 titles. G. M. Kryukov

SUB CODE: 20, 12,

Card 2/2

YERSHOV, G.S. (Zaporozh'ye); ORLOV, Yu.G. (Zaporozh'ye)

Nitrogen behavior in slag and metal phases during the smelting of alloyed steel. Izv. AN SSSR. Met. no.6:28-37 N-D '65. (MIRA 19:1)

1. Submitted October 14, 1964.

ORLOV, Yu.L.

Varieties of crystals and polycrystalline growths of diamonds. Trudy Min.muz. no.16:41-154 '65. (MIRA 18:2)

ORLOV, Yu.L.; PROKOPCHUK, B.I.

Diamonds from the fluvial sediments of the Motorchuna River (diamond-bearing area in the Lena Valley). Trudy Min.muz. no.16:153-165 '65. (MIRA 18:8)

ORLOV, Yu. I., starshiy rybovod

Crab translocation. Nauka i zhizn' 28 no.5:77-78 My '61. (MIRA 14:5)

1. TSentral'naya proizvodstvenno-akklimatizatsionnaya stantsiya Glavgosrybvoda.
(Parents Sea--Crab fisheries)
(Acclimatization)

ORLOV, Yu.I.

Acclimatization of commercial crabs in the Barents Sea. Trudy Gidrobiol. ob-va 12:400-409 '62. (MIRA 15:12)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut morskogo rybnogo khozyaystva i okeanografii i TSentral'naya proizvodstvenno-akklimatizatsionnaya stantsiya Glavgosrybvoda, Moskva.

(Barents Sea--Crabs)
(Animal introduction)

ORLOV, Yu.I.; POLIKASHIN, L.V.

Methods of collecting, transporting and completing the incubation of the eggs of the Atka fish. Trudy Inst. okean. 59:183-190 '62. (MIRA 16:11)

1. TSentral'naya proizvodstvenno-akklimatizatsionnaya stantsiya Glavnogo upravleniye po razvedeniyu ryb i okhrane rybolovstva i Glavnoye upravleniye po razvedeniyu ryb i okhrane rybolovstva pri Sovete Ministrov RSFSR.

S/0057/64/034/008/1341/1344

ACCESSION NR: AP4042916

AUTHOR: Vasil'yev, Ye.N.; Orlov, Yu.I.; Permyakov, V.A.

TITLE: Boundary conditions at the surface of a plasma with rapidly changing parameters

SOURCE: Zhurnal tekhnicheskoy fiziki, v.34, no.8, 1964, 1341-1344

TOPIC TAGS: plasma, plasma boundary layer, inhomogeneous plasma, plasma wave propagation

ABSTRACT: The authors discuss the boundary conditions for a plane electromagnetic wave obliquely incident from the vacuum onto the plane surface of a plasma in which the electron concentration is proportional to the distance from the surface and the collision frequency is independent of position. Under these conditions the gradient of the dielectric constant is a complex function, a, of well-known form of the wave frequency, the collision frequency, and the electron concentration gradient. Maxwell's equations are solved for plane waves incident on the boundary at an arbitrary angle, and the ratio of the electric to the magnetic field components in the boundary plane is calculated for two states of polarization of the incident wave:

1/2

ACC NR: AP6022075 SOURCE CODE: UR/0141/66/009/003/0497/0506

AUTHOR: Orlov, Yu. I.

ORG: Moscow Power-Engineering Institute (Moskovskiy energeticheskiy institut)

TITLE: Some peculiarities in the beam theory of propagation of cylindrical and spherical waves in a slightly inhomogeneous plasma — Part 1

SOURCE: IVUZ. Radiofizika, v. 9, no. 3, 1966, 497-506

TOPIC TAGS: plasma, electromagnetic wave

ABSTRACT: The problem of incidence of a cylindrical (or spherical) locally-planar electromagnetic wave on a slightly inhomogeneous plane-stratified plasma is considered by the methods of beam optics; losses are neglected. It is proven that, even for locally-planar waves, the allowance for the finite divergence of electromagnetic waves results in a qualitatively new behavior of the electro-

Card 1/2 UDC: 621.371.18

ACC NR: AP6022075

magnetic field in a nonhomogeneous plasma. Specifically, the local principle is breached in the nonhomogeneous medium, which imparts certain peculiarities to the caustic surface: singular points (nodes and return points) appear, the caustic forms loops inside the plasma or loops closed in the free semi-space. The coordinates of the caustic singular points are determined for the cases of linear and parabolic laws of variation of electron concentration. The deformations of beam pattern and caustic surface, for various problem parameters, are evaluated. Orig. art. has: 5 figures and 40 formulas.

SUB CODE: 20 / SUBM DATE: 12Jun65 / ORIG REF: 003 / OTH REF: 004

Card 2/2

L 45260-66 EWT(1) IJP(c) AT
ACC NR: AP6026929 SOURCE CODE: UR/0141/66/009/004/0657/0665

76
B

AUTHOR: Orlov, Yu. I.

ORG: Moscow Power Engineering Institute (Moskovskiy energeticheskiy institut)

TITLE: Specific features of the electron-beam theory of propagation of cylindrical and spherical waves in a weakly inhomogeneous plasma. Part 2.

SOURCE: IVUZ. Radiofizika, v. 9, no. 4, 1966, 657-665

TOPIC TAGS: plasma, inhomogeneous plasma, electron beam, electron optics, electromagnetic wave, electron beam theory

ABSTRACT: The problem of the incidence of cylindrical (spherical) electromagnetic waves on an inhomogeneous cylinder (sphere) is investigated by methods of electron-beam optics. It is demonstrated that taking the finite curvature of the wave front and boundary into account leads to peculiarities in the behavior of rays, the caustic surface, and field. Specific caustic points are investigated and determined for hyperbolic and parabolic changes in electron concentration N. The evolution of the caustic

Card 1/2 UDC: 621.371.18

L 45260-66
ACC NR: AP6026929

surface with variation in the position of the source and in the value of gradient N is evaluated. The plane of problem parameters is divided into characteristic regions. [DW]

SUB CODE: 20,09/ SUBM DATE: 22Sep65/ ORIG REF: 004/ OTH REF: 000

Card 2/2

ACC NR: AP6033292 SOURCE CODE: UR/0141/66/009/005/1036/1038

AUTHOR: Orlov, Yu. I.

ORG: Moscow Power Engineering Institute (Moskovskiy energeticheskiy institut)

TITLE: Concerning the penetration of a wave through the caustic in a parabolic plasma layer

SOURCE: IVUZ. Radiofizika, v. 9, no. 5, 1966, 1036-1038

TOPIC TAGS: plasma wave propagation, plasma radiation, plasma diffusion, dielectric constant, geometric optics

ABSTRACT: The author points out that a recently published paper by Yu. A. Kravtsov (Izv. vyssh. uch. zav. - Radiofizika, v. 8, 659, 1965), where a method is proposed for calculating the field of a wave penetrating through the caustic, contains several erroneous statements, in that the field of the rays passing through a parabolic plasmay layer is assumed to have the same zone as the geometric shadow, and the rays inside the plasma layer are assumed tangent to the caustic at the points of largest descent. It is also shown that one of the examples given in the article does not apply. Nevertheless, the method proposed can be used for a parabolic layer when there exists a region where the dielectric constant is less than zero. The author thanks Yu. A. Kravtsov for a discussion and for interest in the remarks. Orig. art. has: 1 figure and 3 formulas.

SUB CODE: 09, 20/ SUBM DATE: 17Mar66/ ORIG REF: 003/ OTH REF: 003

Card 1/1 UDC: 621.371.18

L 15047-66 EWT(d)/EWP(1) IJP(c) BB/GG

ACC NR: AP6002149 SOURCE CODE: UR/0280/65/000/006/0059/0064

AUTHOR: Orlov, Yu. K. (Moscow): Natkovich, Yu. S. (Moscow)

56
B

ORG: none

16 44

TITLE: Recognition algorithm

SOURCE: AN SSSR. Izvestiya. Tekhnicheskaya kibernetika, no. 6, 1965, 59-64

TOPIC TAGS: pattern recognition, recognition process

ABSTRACT: Any point of an n-dimensional space R_n which is determined by a set of n real coordinates $a(a_1, a_2, \ldots, a_i, \ldots, a_n) \in R_n$ is called an "object." If for each class (or subset) A^j the distribution of objects in space is known $P(a \in A^j)$, then for each object $a \in R_n$ the classification can be performed on the basis of $\max_j [P(a \in A^j)]$. The article proves that, with certain limitations, the calculation of probability $P(a \in A^j)$ can be reduced to the computation of $U(a, A^j) = \sum_{i=1}^{n} \frac{(a_i - S_i^j)^2}{D_i^j}$, which is called the

Card 1/2

2

L 15047-66

ACC NR: AP6002149

"degree of remoteness" of the object from the class A^j. The algorithm comprises three parts: a preliminary description of the class standard, a recognition proper, and a subsequent correction of the standard descriptions. A criterion of reliable recognition is introduced. Although the algorithm has been constructed for the normal law of distribution for each component of the object-describing vector with no correlation between components, it is, nevertheless, applicable to the cases with off-normal distributions and dependent components. Only 10 to 20 samples of each class are needed. The algorithm self-improves on the basis of its own recognitions, is so-to-say "statistically tracking," and adapts itself to the characteristics of the objects being recognized. "In conclusion, the authors wish to thank A. L. Lunts and V. S. Fayn for useful discussions, and also V. L. Brailovskiy for his valuable advice and comments." Orig. art. has: 2 figures and 21 formulas.

SUB CODE: 12, 13 / SUBM DATE: 11May65 / ORIG REF: 001

Card 2/2

ORLOV, Yu.L.

Syngenetic and epigenetic inclusions in diamond crystals. Trudy Min.mus. no.10:103-120 '59. (MIRA 16:8)
(Diamond crystals)

ORLOV, Yu.L.; GINZBURG, A.I.; PINEVICH, N.G.

Paragenetic relationships between beryl minerals in certain veins of pegmatites. Trudy Min. muz. no.11:103-113 '61.
(MIRA 16:7)

(Beryl) (Pegmatites)

ORLOV, Yu.L.; MART'YANOV, N.M.

Rare earth vesuvianite from the Yenisey Ridge. Trudy Min. muz. no.11:187-190 '61. (MIRA 16:7)

(Yenisey Ridge—Vesuvianite)

ORLOV, Yu.L.

Solution and corrosion of diamond crystals in the formation process and autometamorphism of diamond-bearing rocks. Trudy Min. muz. no.13:62-78 '62. (MIRA 16:2)
(Diamond crystals)

ORLOV, Yuriy Leonidovich; BARSANOV, G.P., doktor geol.-miner. nauk, otv. red.; MINYAYLOVA, G.A., red.izd-va; GUSEVA, A.P., tekhn. red.

[Morphology of diamond] Morfologiia almaza. Moskva, Izd-vo AN SSSR, 1963. 233 p. (MIRA 16:10)
(Diamond crystals)

URUSOVSKAYA, A.A.; ORLOV, Yu.L.

Nature of the plastic deformation of diamond crystals. Dokl. AN SSSR 154 no.5:1099-1102 F'64. (MIRA 17:2)

1. Mineralogicheskiy muzey im. A.Ye. Fersmana AN SSSR. Predstavleno akademikom D.I. Shcherbakovym.

MIUSKOV, V.F.; ORLOV, Yu.L.

X-ray diffraction-topographic examination of Yakutian diamonds.
Dokl. AN SSSR 166 no.1:198-201 Ja '66. (MIRA 19:1)

1. Institut kristallografii AN SSSR i Mineralogicheskiy muzey im. A.Ye.Fersmana AN SSSR. Submitted July 16, 1965.

L 24338-66 EWP(k)/EWP(h)/EWT(d)/EWP(w)/EWP(l) GS

ACC NR: AT6005907 SOURCE CODE: UR/0000/65/000/000/0281/0291

AUTHOR: Uskov, A. S.; Orlov, Yu. M.

56
B+1

ORG: None

TITLE: A multichannel correlator for the statistical processing of random processes in industrial automatic control systems

14

SOURCE: International Federation of Automatic Control. International Congress. 2d, Basel, 1963. Tekhnicheskiye sredstva avtomatiki (Technical means of automation); trudy kongressa. Moscow, Izd-vo Nauka, 1965, 281-291

TOPIC TAGS: automatic control system, computer control system, random process, correlation function, computer design, industrial automation

ABSTRACT: The authors develop a theory and design a correlator which, with minimum delay and tolerable degree of accuracy, reads out within specific discrete intervals of time an entire correlation function in the form of several ordinates. An evaluation is made of the theoretical error of the calculation for the general case when the random function contains the constant component, i.e., $Ex(t) \neq 0$. The method of computing in the multichannel correlator is presented in detail. The units and elements of the device are described and the operational procedures are outlined. Orig. art. has: 9 figures and 11 formulas.

SUB CODE: 09, 13 / SUBM DATE: 23Jun65 / ORIG REF: 006 / OTH REF: 002

Card 1/1 PB

32578
S/621/61/000/000/014/014
D234/D303

9,7200

AUTHORS: Orlov, Yu.M., and Uskov, A.S.

TITLE: A specialized computer for determining dynamic characteristics, simulation and correction of automatic control systems

SOURCE: Nauchno-tekhnicheskoye obshchestvo priborostroitel'noy promyshlennosti. Primeneniye vychislitel'noy tekhniki dlya avtomatizatsii proizvodstva. Trudy soveshchaniya, provedennogo v oktyabre 1959 g. Ed. by V.V. Solodovnikov. Moscow, Mashgiz, 1961, 503 - 517

TEXT: The authors give the technical characteristics of a controlled filter designed at TsNIIKA for calculating integrals of the type

$$y(t) = \int_0^\infty x(t - \theta)k(\theta)d\theta \qquad (1)$$

The filter consists of 1) a magnetic tape delay line for retaining

Card 1/2

USKOV, A. S.; ORLOV, Yu. m

"Design Principles and Circuit of Multichanneled Correlatograph for a Specialized Computer."

Paper to be presented at the IFAC Congress, to be held in Basel, Switzerland, 27 Aug to 4 Sep 63

L 12484-63 BDS S/102/63/000/002/006/007

AUTHOR: Uskov, A. S. and Orlov, Yu. M. 41

TITLE: Principles of construction and circuit of a multichannel correlograph

PERIODICAL: Avtomatyka, no. 2, 1963, 64-75

TEXT: The article describes the recently developed multichannel correlograph and its theoretical basis. This circuit has two basic advantages: a. it is multichannel, i.e. it simultaneously calculates several ordinates of the correlating function, which in turn factilitates its use in self-tuning automatic control circuits; b. the use of displacement in the circuit facilitates increased precision of calculation of correlating functions. This refers particularly to those realizations in which mathematical expectation greatly exceeds the maximum pulsation, which occurs in the majority of industrial automatic control systems. A circuit was worked out on the basis of a theoretical study of various factors which influence the accuracy of calculation of correlation functions. The upper value of the root-mean-square error was obtained for the general case. A derived formula enables the authors to select the optimum method for calculating

Card 1/2

L 12484-63
Principles of construction .....

S/102/63/000/002/006/007

correlation functions (from the standpoint of precision) as well as the schematic diagram of the correlograph. A detailed description is given of stages and elements of the multichannel correlograph and their block and schematic diagrams. The article describes a procedure for operating such a multi-channel correlograph. The article contains 9 figures and a 7 item bibliography.

SUBMITTED: October 10, 1961.

Card 2/2

BRILL', D.Ye., prof.; ORLOV, Yu.M., inzh.

Investigating valves for marine automatic control systems.
Sudostroenie 29 no.7:30-31 Jl '63. (MIRA 16:9)
(Marine engineering) (Hydraulic control)

ORLOV, Yu.V.

Mechanized ice corer. Trudy GGI no.106:139-142 '63. (MIRA 16:8)
(Ice coring rigs)

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001238