It is a wire transfer from Russian – everything that I could make.

Operating in interests of physics, I ask those, who are disturbed by the future of a science and who possesses corresponding abilities to translate “the field theory of elementary particles” from Russian on other languages. I give the right to publish transfer in 2011-2012 on the Internet or any publishing house with obligatory instructions of the primary source.

Vladimir Gorunovich.

Это электронный перевод с русского языка – все, что я смог сделать сам.

Действуя в интересах физики, я прошу тех, кто обеспокоен будущим науки и кто обладает соответствующими способностями осуществить перевод «полевой теории элементарных частиц» с русского языка на другие языки. Я предоставляю право опубликовать перевод в 2011-2012 годах в интернете или любом издательстве с обязательным указанием первоисточника.

Владимир Горунович.

17.05.2011

V.A. Gorunovich, THE FIELD THEORY OF ELEMENTARY PARTICLES.

Part 2

According to the consecutive theory weeding a powerful matter or elementary particles making it followed consider as special type of "field", or special «space conditions».

Albert Einstein [1]

To my teachers of physics it is devoted

THE SUMMARY

The second fragment of the field theory of elementary particles is developed. The structure of constant electromagnetic fields of elementary particles and the mechanism of formation and quantization of an electric charge is in detail described. That is allows counting interactions of constant electromagnetic fields of elementary particles, including "nuclear" interactions.

PACS numbers: 03.50. Kk, 11.10.-z, 12.10.-g

1. INTRODUCTION

My great predecessors of Maxwell, Einstein and their supporters assumed that the substance consists of a field in particular from an electromagnetic field. With opening of elementary particles attempts to explain their structure proceeding from an electromagnetic field have been made. But something hasn't turned out, and the fine idea has been forgotten. The physics of the twentieth century began to develop in other direction and with shine was at a deadlock. We will try to give new life to the forgotten idea, slightly it having corrected.

Classical electrodynamics (which else nobody has cancelled) allocates three kinds of electromagnetic fields:

– A constant electric field;

– A constant magnetic field;

– A variable electromagnetic field.

From experiments we know that elementary particles have a constant electric field and a constant magnetic field. Besides elementary particles possess wave properties that is characteristic feature of a variable electromagnetic field. Thus, it is possible to assert that in elementary particles there is also a variable electromagnetic field. In that specific case the photon (rest having zero weight) has only a variable electromagnetic field.

So, the answer to a question of what elementary particles consist - is obvious. There is a question - as particularly they are arranged? We also will be engaged in this question.

All subsequent actions will start with following statements:

– The law of conservation of energy and also other laws of the nature operate at any moment Δt;

– Laws of classical electrodynamics operate on a level with quantum mechanics;

– Magnetic fields of elementary particles aren't created by spin rotation of an electric charge;

– The weight of rest of an elementary particle (m0) consists of two components: weights of a rotating variable electromagnetic field and weight connected with it of constants electric and magnetic water;

– In interactions of elementary particles it is possible to allocate two components: interactions of variable electromagnetic fields on which action of quantum mechanics and interaction of constants electric extends and magnetic fields on which action of classical electrodynamics extends.

2. STRUCTURE OF THE ELEMENTARY PARTICLE

2.1. Structure of a variable electromagnetic field

It is supposed that in an elementary particle the polarized variable electromagnetic field rotates.

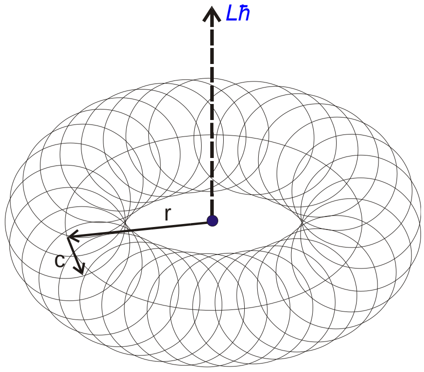

Figure 1 Schematic image of an elementary particle.

About this field a little that is known. For continuity preservation weeding length of a wave it can be equal $h/2m_{0\sim}c$ or $Lh/m_{0\sim}c$, where L – the main quantum number, and $m_{0\sim}$ – weight of a variable electromagnetic field. But the variant of standing waves is supposed also: in this case the length of a wave will correspond to classical electrodynamics ($h/m_{0\sim}c$) and $2L$ will be equal to number of half-cycles. On the other hand, the length of a circle divided on 2π is equal to average radius of rotation of weight of a variable electromagnetic field. Thus, the specified formula of radius of an elementary particle will be following:

$$r=L\hbar/m_{0\sim}c \qquad (1)$$

The weight of rest of an elementary particle (m_0) consists of two making - weights of a variable electromagnetic field ($m_{0\sim}$) and weights of constants electric and magnetic fields ($m_{0=}$). But as on experience it is measured only m0, and the size m_0, and the size $m_{0=}$ makes all some percent from m_0 – that in some cases expediently in calculations to use m_0, and there where it is required to enter correction factors.

Diameter of cross-section section of a variable electromagnetic field too is defined by weight of a variable electromagnetic field and it is supposed equal $d=\hbar/m_{0\sim}c$. Hence, the section radius will be equal

$$r_d=\hbar/2m_{0\sim}c \qquad (2)$$

Why the nature has again chosen Planck's constant – the reason for that the quantum mechanics which underlies a microcosm. As to factor on the one hand r_d should be no more r for any group of elementary particles, so and for leptons ($L={}^1/_2$). On the other hand such size r_d allows to separate leptons from other groups of elementary particles (as we then will see, at the given formula r_d leptons don't possess "strong" interactions).

Polarization of a variable electromagnetic field most likely coincides with polarization of constant fields and can accept one of four steady values. Rotation can be carried out or in a plane of an electric component or in a plane of a magnetic component.

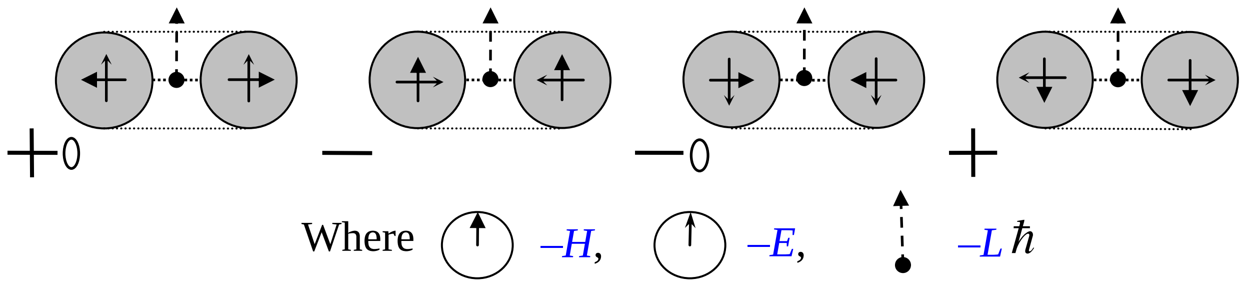

Figure 2 Cross-section of elementary particles (4 variants of polarization). Arrows specify polarization of constant fields as they define presence of an electric charge.

Any equations of a field I will not offer. We will simply assume that there is some distribution of a variable electromagnetic field such that almost all its weight is concentrated in section with radius r_d and it rotates on average radius r.

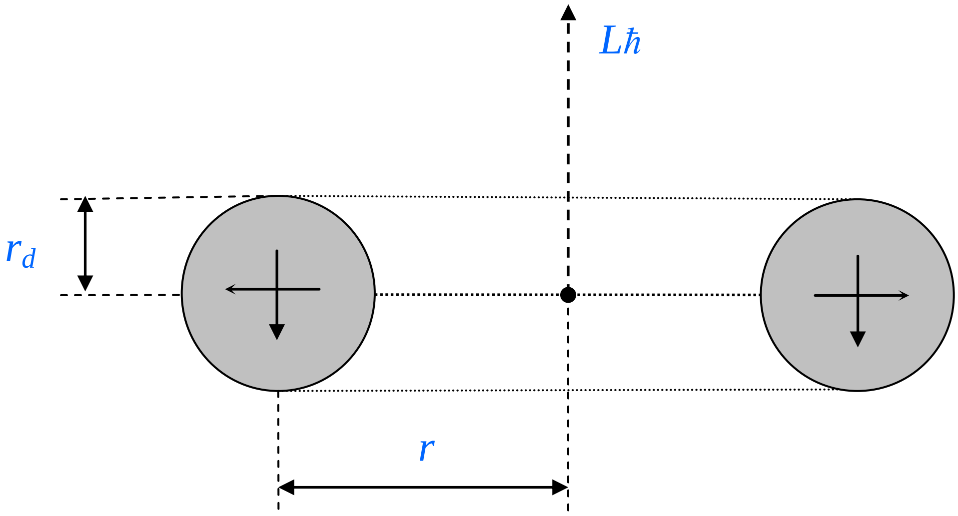

Figure 3 Cross-section of the charged elementary particle.

2.2. Structure of constant electric field

In drawings constant electric field charged (Figure 4) and neutral (Figure 5) elementary particles-antiparticles are schematically presented.

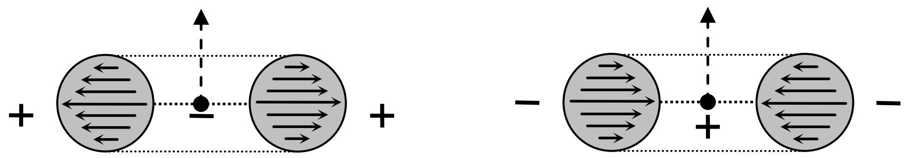

Figure 4 Cross-section of the charged elementary particles.

Figure 5 Cross-section of neutral elementary particles.

Constant electric field is created by the polarized sphere with power lines. Depending on polarization we will receive the charged elementary particle-antiparticle with a charge $\pm e$ or a neutral particle-antiparticle different signs on dipolar electric field. As we will see further, the charged elementary particles also possess dipolar electric field. The reasons of quantization of an electric charge will be considered a little later.

2.3. Structure of a constant magnetic field

In drawings the constant magnetic field charged (Figure 6) and a neutral (Figure 7) elementary particle is schematically presented.

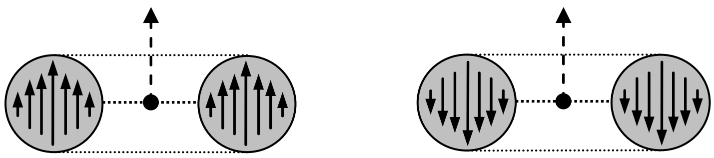

Figure 6 Cross-section of the charged elementary particles

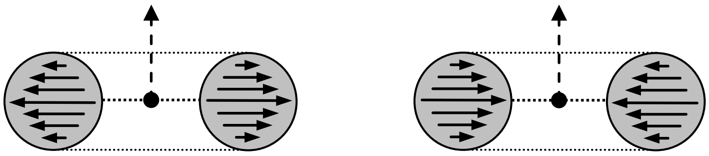

Figure 7 Cross-section of neutral elementary particles

The constant magnetic field is created by the polarized sphere with power lines. Depending on polarization we will receive a magnetic field of the charged elementary particle-antiparticle or a magnetic field of a neutral particle-antiparticle. The magnetic field of the charged elementary particle-antiparticle creates the magnetic moment of an order $\mu_L = eL\hbar/m_0c$. The Magnetic field of neutral particles presented on Figure 7 doesn't create the magnetic moment. But neutral elementary particles have one more constant magnetic field creating the magnetic moment – a field of an internal ring current of radius $r = L\hbar/m_{0\sim}c$.

Unlike an electric charge the magnetic moments on a straight line aren't quantized.

3. STRUCTURE OF THE CHARGED ELEMENTARY PARTICLE

3.1. Structure of constant electric field

Constant electric field of the charged elementary particle consists of following areas (Figure 8 see):

– ring area with the power lines generating a field, lying in a plane of rotation of a particle. Power lines are directed in parallel a plane of rotation of a particle;

– the area of an external field had on distances has more than radius of an elementary particle;

– areas of an internal field of an elementary particle had in radius, and having an opposite sign.

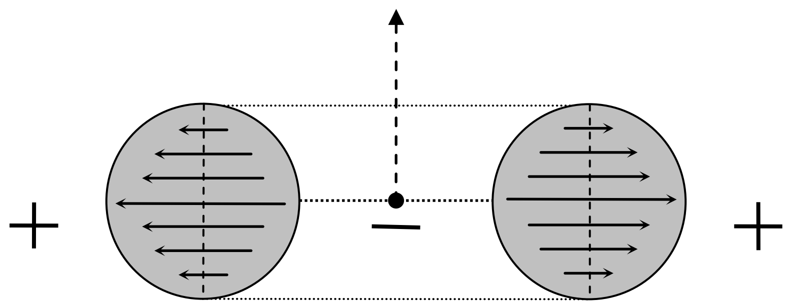

Figure 8 Cross-section of electric field of the charged elementary particle.

Thus, electric field is dipolar. The external field is created by an external hemisphere of ring area, and an internal field – an internal hemisphere.

Let's define size of a stream of the electric field, created by an external hemisphere.

Let's consider a possible variant of distribution of a field (distribution 1).

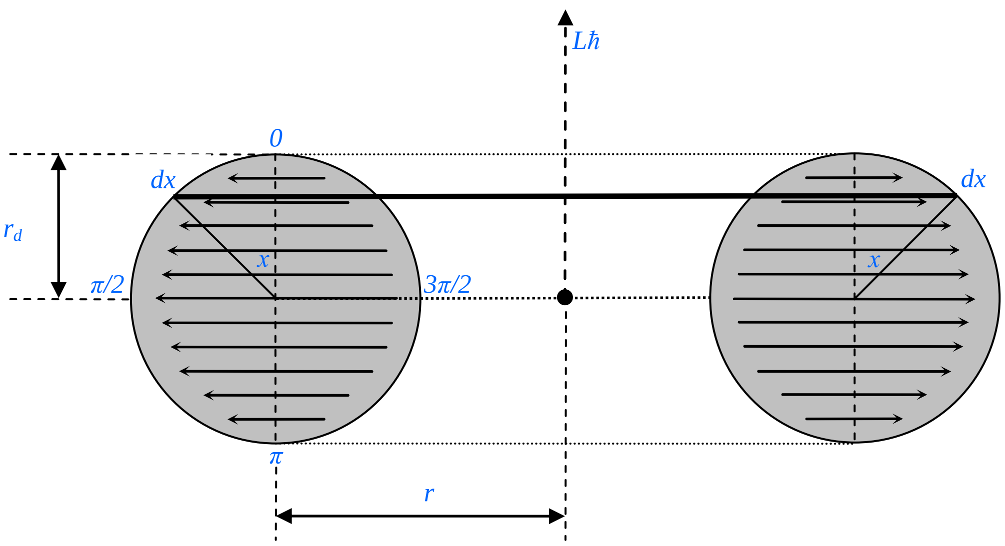

Figure 9 Structure of constant electric field.

We take a segment of ring area (Figure 9) thickness dx with a corner between a segment and a line of symmetry of ring area equal x. The segment area will be equal

$$ds = r_d \cdot dx \cdot 2\pi \cdot (r + r_d \cdot \sin(x)) \qquad (3)$$

The created stream of electric field of a ring segment will be equal

$$d\varphi = E_m \cdot \sin^2(x) \cdot ds = E_m \cdot [2\pi \cdot r_d \cdot r \cdot \sin^2(x) + 2\pi \cdot r_d^2 \cdot \sin^3(x)] \cdot dx \qquad (4)$$

E_m – the maximum intensity of electric field on a surface of ring area.

The multiplier $\sin^2(x)$ arises for the following reason:

– one $\sin(x)$ is given by field polarization as the stream passing through an arch, is defined not only the sizes of an arch, but also an angle of slope;

– the second $\sin(x)$ arises because the stream is proportional to a thickness of a layer of a segment creating electric field.

It is supposed that elementary particles can have such distribution of a field.

Thus, the total stream of electric field created by an external hemisphere is equal

$$\Phi_+ = 2\pi \cdot r \cdot r_d \cdot E_m \cdot \int_0^{\pi} sin^2(x)dx + 2\pi \cdot r_d^2 \cdot E_m \cdot \int_0^{\pi} sin^3(x)dx = \pi^2 \cdot r \cdot r_d \cdot E_m + 8\pi/3 \cdot r_d^2 \cdot E_m \quad (5)$$

Similarly, the total stream of electric field created by an internal hemisphere is equal

$$\Phi_- = 2\pi \cdot r \cdot r_d \cdot E_m \cdot \int_0^{-\pi} sin^2(x)dx + 2\pi \cdot r_d^2 \cdot E_m \cdot \int_0^{-\pi} sin^3(x)dx = -\pi^2 \cdot r \cdot r_d \cdot E_m + 8\pi/3 \cdot r_d^2 \cdot E_m \quad (6)$$

The difference between modules of streams of external and internal hemispheres creates a constant field of an electric charge and is equal

$$\Delta\Phi = (16\pi/3) \cdot r_d^2 \cdot E_m \quad (7)$$

As we see a stream

$$\Phi_d = 2\pi \cdot r \cdot r_d \cdot E_m \cdot \int_0^{\pi} sin^2(x)\, dx = \pi^2 \cdot r \cdot r_d \cdot E_m \quad (8)$$

and its negative analog creates a constant electric dipolar field.

Let's consider two more distributions of a field for comparison.

<u>In distribution 2</u> we will clean dependence of a stream of a segment on a thickness of the layer creating electric field of a segment (weaker distribution).

In this case the created stream of electric field of a ring segment will be equal

$$d\varphi = E_m \cdot sin(x) \cdot ds = E_m \cdot [2\pi \cdot r_d \cdot r \cdot sin(x) + 2\pi \cdot r_d^2 \cdot sin^2(x)] \cdot dx \quad (9)$$

And the total stream of electric field created by an external hemisphere is equal

$$\Phi_+ = 2\pi \cdot r \cdot r_d \cdot E_m \cdot \int_0^{\pi} sin(x)\, dx + 2\pi \cdot r_d^2 \cdot E_m \cdot \int_0^{\pi} sin^2(x)\, dx = 4\pi \cdot r \cdot r_d \cdot E_m + \pi^2 \cdot r_d^2 \cdot E_m \quad (10)$$

Similarly, the total stream of electric field created by an internal hemisphere is equal

$$\Phi_- = 2\pi \cdot r \cdot r_d \cdot E_m \cdot \int_0^{-\pi} sin(x)\, dx + 2\pi \cdot r_d^2 \cdot E_m \cdot \int_0^{-\pi} sin^2(x)\, dx = -4\pi \cdot r \cdot r_d \cdot E_m + \pi^2 \cdot r_d^2 \cdot E_m \quad (11)$$

The difference between modules of streams of external and internal hemispheres creates a constant field of an electric charge and is equal

$$\Delta \Phi = 2\pi^2 \cdot r_d^2 \cdot E_m \tag{12}$$

Well and a stream

$$\Phi_d = 2\pi \cdot r \cdot r_d \cdot E_m \cdot \int_0^{\pi} \sin(x)\, dx = 4\pi \cdot r \cdot r_d \cdot E_m \tag{13}$$

and its negative analog creates a constant electric dipolar field.

In distribution 3 we will strengthen dependence of a stream of a segment on a corner x, suppose, that the stream is proportional $\sin^3(x)$ - is proportional to a square of a thickness of a layer of a segment creating electric field (stronger distribution).

In this case the created stream of electric field of a ring segment will be equal

$$d\varphi = E_m \cdot \sin^3(x) \cdot ds = E_m \cdot [2\pi \cdot r_d \cdot r \cdot \sin^3(x) + 2\pi \cdot r_d^2 \cdot \sin^4(x)] \cdot dx \tag{14}$$

And the total stream of electric field created by an external hemisphere is equal

$$\Phi_+ = 2\pi \cdot r \cdot r_d \cdot E_m \cdot \int_0^{\pi} \sin^3(x)\, dx + 2\pi \cdot r_d^2 \cdot E_m \cdot \int_0^{\pi} \sin^4(x)\, dx = 8\pi/3 \cdot r \cdot r_d \cdot E_m + 6\pi^2/8 \cdot r_d^2 \cdot E_m \tag{15}$$

Similarly, the total stream of electric field created by an internal hemisphere is equal

$$\Phi_- = 2\pi \cdot r \cdot r_d \cdot E_m \cdot \int_0^{-\pi} \sin^3(x)\, dx + 2\pi \cdot r_d^2 \cdot E_m \cdot \int_0^{-\pi} \sin^4(x)\, dx = -8\pi/3 \cdot r \cdot r_d \cdot E_m + 6\pi^2/8 \cdot r_d^2 \cdot E_m \tag{16}$$

The difference between modules of streams of external and internal hemispheres creates a constant field of an electric charge and is equal

$$\Delta \Phi = 3\pi^2/2 \cdot r_d^2 \cdot E_m \tag{17}$$

Well and a stream

$$\Phi_d = 2\pi \cdot r \cdot r_d \cdot E_m \cdot \int_0^{\pi} \sin^3(x)\, dx = 8\pi/3 \cdot r \cdot r_d \cdot E_m \tag{18}$$

and its negative analog creates a constant electric dipolar field.

All three variants of distribution of a field possess the general law – a stream creating a constant field of an electric charge, doesn't depend on an accessory of an elementary particle to this or that group (from quantum number L).

The area of a surface of an external hemisphere creating external electric field is equal

$$S_{+}=\int_{0}^{\pi} ds = 2\pi \cdot r \cdot r_d \cdot\int_{0}^{\pi} dx + 2\pi \cdot r_d^2 \cdot\int_{0}^{\pi} sin(x)\, dx = 2\pi^2 \cdot r \cdot r_d + 4\pi \cdot r_d^2 \tag{19}$$

The area of a surface of an internal hemisphere creating internal electric field is equal

$$S_{-}=\int_{\pi}^{2\pi} ds = 2\pi \cdot r \cdot r_d \cdot\int_{\pi}^{2\pi} dx + 2\pi \cdot r_d^2 \cdot\int_{\pi}^{2\pi} sin(x)\, dx = 2\pi^2 \cdot r \cdot r_d - 4\pi \cdot r_d^2 \tag{20}$$

The electric charge of an elementary particle is created by a difference of these areas ΔS (and accordingly a difference of streams) a geometrical figure arising owing to feature.

$$\Delta S = S_{+} - S_{-} = 8\pi \cdot r_d^2 \tag{21}$$

If the areas of both hemispheres were equal (that will be at field straightening – its transformation in moving rectilinearly with a velocity of light a linear field) then streams therefore presence of an electric charge at such structure becomes impossible will be made even also.

So, the external hemisphere creates constant electric field. In case of distribution to 1 it there corresponds a stream and its area creating:

$$\Phi_{+}= \pi^2 \cdot r \cdot r_d \cdot E_m + 8\pi/3 \cdot r_d^2 \cdot E_m \tag{22}$$

$$S_{+}=2\pi^2 \cdot r \cdot r_d + 4\pi \cdot r_d^2 \tag{23}$$

Accordingly the internal hemisphere also creates constant electric field to which correspond:

$$\Phi_{-} = -\pi^2 \cdot r \cdot r_d \cdot E_m + 8\pi/3 \cdot r_d^2 \cdot E_m \tag{24}$$

$$S_{-} = 2\pi^2 \cdot r \cdot r_d - 4\pi \cdot r_d^2 \tag{25}$$

Let's enter designations:

$$\pi^2 \cdot r \cdot r_d \cdot E_m = \Phi_d \tag{26}$$

$$8\pi/3 \cdot r_d^2 \cdot E_m = \Phi_e/2 \tag{27}$$

$$2\pi^2 \cdot r \cdot r_d = S_d \tag{28}$$

$$4\pi \cdot r_d^2 = S_e/2 \tag{29}$$

From the point of view of an electrostatics such field looks strange – not as a field of a dot elementary electric charge or its any spherical distribution. But the matter is that here the theorem of Gauss for the present doesn't work – it will start to work on the big distances when electric field is transformed in coulomb. And it for the present hasn't occurred – field transformation only begins. After all we consider the polarized electric field on the border creating it of sphere. And the mathematics here is a bit other.

The matter is that the field of an electric charge of an elementary particle is created not by the areas (S_+ , S_-) and streams (Φ_+ , Φ_-) but their differences (ΔS and $\Delta\Phi$). Thus, the electric charge of an elementary particle is defined by the relation $\Delta\Phi$ to ΔS. For the first distribution will be

$$\Delta\Phi/\Delta S = \Phi_e/S_e = (16\pi/3) \cdot r_d^2 \cdot E_m/(8\pi \cdot r_d^2) = 2/3 \cdot E_m \equiv e \tag{30}$$

Other distributions differ in factor a little. For distribution ($e = (\pi/4) \cdot E_m$) and for distribution 3 ($e = (3\pi/16) \cdot E_m$).

<u>As we see, the electric charge of an elementary particle doesn't depend on an accessory of an elementary particle to this or that group (from quantum number L) from its weight of rest. At the heart of the mechanism of quantization of an electric charge of elementary particles the geometry and a structure of elementary particles lie.</u>

Now we will express Φ_d through Φ_e and S_d through S_e.

$$\Phi_d = \pi^2 \cdot r \cdot r_d \cdot E_m = 3\pi/16 \cdot r/r_d \cdot \Phi_e \tag{31}$$

$$S_d = 2\pi^2 \cdot r \cdot r_d = \pi/4 \cdot r/r_d \cdot S_e \qquad (32)$$

Let's divide Φ_d on S_d and we will receive a dipolar electric charge

$$Q_d = \pm (3/4) \cdot e \qquad (33)$$

Other distributions also differ in factor. For distribution 2 ($Q_d = \pm (2/\pi) \cdot e$), and for distribution 3 ($Q_d = \pm (16/9\pi) \cdot e$).

3.2. Structure of a constant magnetic field

The constant magnetic field of the charged elementary particle consists of following areas:

– ring area with the power lines generating a field, lying in a plane of rotation of a particle (Figure 10 see). Power lines are directed perpendicularly to a plane of rotation of a particle;

– areas of a field with the magnetic moment of an order $er=eL\hbar/m_0c$ (e – an elementary electric charge, r – radius of an elementary particle). The given field arises simultaneously with electric field, instead of owing to spin rotation of an electric charge.

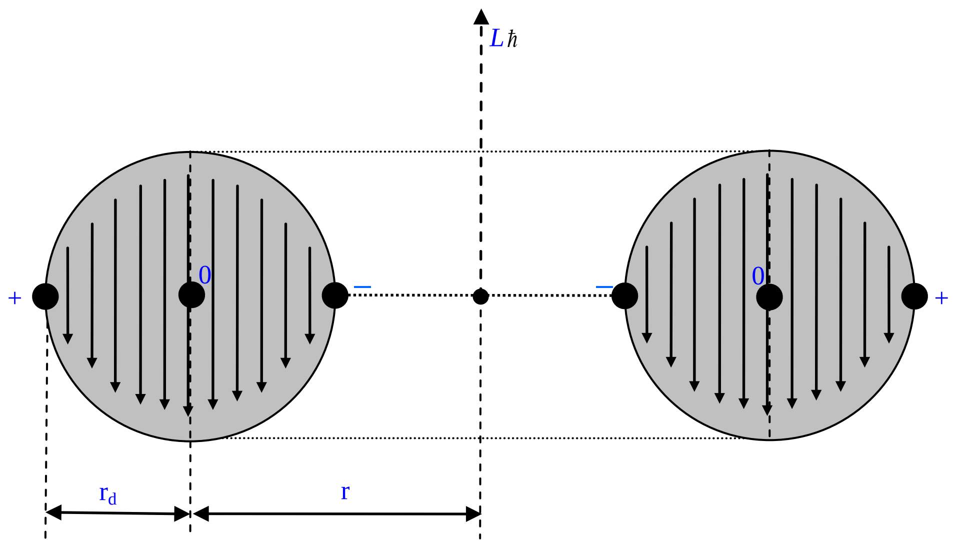

Figure 10 Cross-section of a magnetic field of the charged elementary particle.

As well as in case of electric field, intensity of a magnetic field is proportional to a thickness of a layer of a segment creating a field. Thus, the intensity maximum is reached in the top and bottom points of ring area. We will assume that there is such distribution of currents.

The magnetic field of the charged elementary particle basically is created by two distributed currents (+ and –), lying in a plane of the particle, identical size, radiuses ($r + r_d$) and ($r - r_d$) and an opposite direction.

The magnetic dipolar moment of an external current (we name it μ_{L+}) equal

$$\mu_{L+} = (I/c) \cdot \pi \cdot (r + r_d)^2 = (I/c) \cdot \pi \cdot r_d^2 \cdot (2L + 1)^2 \qquad (34)$$

Similarly magnetic dipolar moment of an internal current (we name it μ_{L-}) equal

$$\mu_{L-} = (I/c) \cdot \pi \cdot (r - r_d)^2 = (I/c) \cdot \pi \cdot r_d^2 \cdot (2L - 1)^2 \qquad (35)$$

The magnetic dipolar moment of a particle as a whole μ_L is equal to their difference

$$\mu_L = (I/c) \cdot \pi \cdot r_d^2 \cdot [(2L + 1)^2 - (2L - 1)^2] = (I/c) \cdot 8\pi \cdot L \cdot r_d^2 \equiv eL\hbar/ m_0c$$

(36)

Now we can express μ_{L+} and μ_{L-} through μ_L.

$$\mu_{L+} = [(I/c) \cdot\pi \cdot r_d^2 \cdot(2L +1)^2]/[(I/c)\cdot 8\pi \cdot L \cdot r_d^2]\cdot \mu_L = [(2L+1)^2/8L]\cdot eL\hbar/m_0c$$

(37)

$$\mu_{L-} = [(I/c) \cdot\pi \cdot r_d^2 \cdot(2L -1)^2]/[(I/c) \cdot 8\pi \cdot L \cdot r_d^2]\cdot \mu_L = [(2L-1)^2/8L]\cdot eL\hbar/m_0c$$

(38)

It is necessary to substitute quantum number L, to receive the preliminary magnetic moments of the currents creating a constant magnetic field of charged elementary particles. For reception of the definitive magnetic moments of currents it is necessary to consider two more factors.

First: the Size of the magnetic moment of an elementary particle is defined by quantum numbers L and M_L. Therefore the size of the magnetic moments of currents is necessary for increasing by function

$$1 + f_e(M_L,L) \approx 1 + [1- (|M_L|/L)^{L/2}]/2L$$

More precisely $f_e(M_L,L)$ it is possible to define function by means of quantum mechanics. For simplicity it is possible to consider $f_e(M_L,L)=0$, when $|M_L|=L$ (for a proton, an electron and a muon).

Secondly: the Size of the magnetic moment of an elementary particle is defined by percent of energy concentrated in a variable electromagnetic field. Thus, the received value is necessary for increasing by the relation $m_{0\sim}/m_0$.

As a result we will receive:

$$\mu_{L+} = m_{0\sim}/m_0 \cdot (1 + f_e(M_L,L)) \cdot [(2L+1)^2/8L] \cdot eL\hbar/m_0c \qquad (39)$$

$$\mu_{L-} = m_{0\sim}/m_0 \cdot (1 + f_e(M_L,L)) \cdot [(2L-1)^2/8L] \cdot eL\hbar/m_0c \qquad (40)$$

The charged elementary particles besides have a magnetic field created by spin rotation. Its magnetic moment is equal

$$\mu_0 = (I_0/c) \cdot \pi \cdot r^2 \cdot J = 0.0265 \cdot J\, e\hbar/m_0c$$

and it can be considered as an additive to the magnetic moments of external and internal currents. The given size of the magnetic moment is taken from calibration for the magnetic moment on electron (distributions 2 Figure 17). Probably, further it will be specified.

The total magnetic dipolar moment of a particle as a whole μ_L is equal

$$\mu_L = (m_{0\sim}/m_0 \cdot (1 + f_e(M_L,L)) \cdot L + 0{,}0265 \cdot J)\, e\hbar/\, m_0c \qquad (41)$$

4. STRUCTURE OF THE NEUTRAL ELEMENTARY PARTICLE

4.1. Structure of constant electric field

Constant electric field of a neutral elementary particle (*Q=0*) consists of following areas:

– ring area with the power lines generating a field, lying in a plane of rotation of a particle (Figure 11 see). Power lines are directed perpendicularly to a plane of rotation of a particle;

– areas of a zero external field had on distances much more radius of an elementary particle;

– areas of an internal field had on distances of an order of radius of the elementary particle consisting of two symmetric zones with an opposite sign, divided by a plane of rotation of a particle.

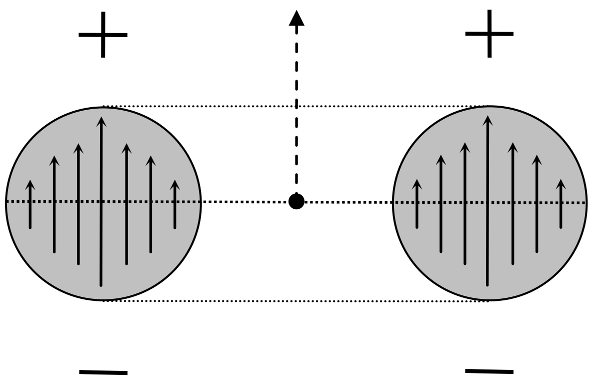

Figure 11 Cross-section of electric field of a neutral elementary particle.

Thus, electric field is dipolar. The top field is created by the top hemisphere of ring area, and the bottom field – the bottom hemisphere.

Let's define size of a stream of the electric field, created by the top hemisphere.

Similarly I weed the charged elementary particle; we will consider the same three distributions, having changed field polarization on $\pi/2$ and integration limits.

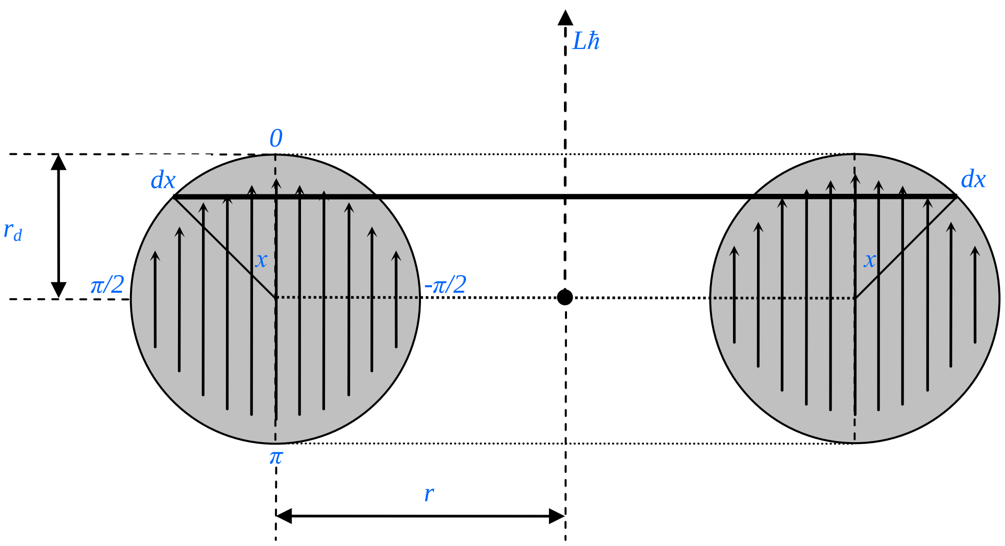

Figure 12 Structure of constant electric field.

<u>Let's consider distribution 1.</u>

We take a segment of ring area (Figure 12) thickness dx with a corner between a segment and a line of symmetry of ring area equal x. The segment area will be former

$$ds = r_d \cdot dx \cdot 2\pi \cdot (r + r_d \cdot \sin(x)) \quad (42)$$

The created stream of electric field of a ring segment will be equal now

$$d\varphi = E_m \cdot \cos^2(x) \cdot ds = E_m \cdot [2\pi \cdot r_d \cdot r \cdot \cos^2(x) + 2\pi \cdot r_d^2 \cdot \cos^2(x) \cdot \sin(x)] \cdot dx \quad (43)$$

E_m – the maximum strength of electric field on a surface of ring area.

The multiplier $\cos^2(x)$ has appeared instead of $\sin^2(x)$ as a result of change of polarization of a field on $\pi/2$.

Thus, the total stream of electric field created by the top hemisphere is equal

$$\Phi_{+} = 2\pi \cdot r \cdot r_d \cdot E_m \cdot \int_{-\pi/2}^{+\pi/2} \cos^2(x)dx + 2\pi \cdot r_d^2 \cdot E_m \cdot \int_{-\pi/2}^{+\pi/2} \cos^2(x) \cdot \sin(x)dx$$

$$= \pi^2 \cdot r \cdot r_d \cdot E_m + 0 \quad (44)$$

Similarly, the total stream of electric field created by the bottom hemisphere is equal

$$\Phi_{-} = -\{2\pi \cdot r \cdot r_d \cdot E_m \cdot \int_{+\pi/2}^{+3\pi/2} \cos^2(x)dx + 2\pi \cdot r_d^2 \cdot E_m \cdot \int_{+\pi/2}^{+3\pi/2} \cos^2(x) \cdot$$

$$\sin(x)dx\} = -\pi^2 \cdot r \cdot r_d \cdot E_m + 0 \quad (45)$$

The difference between modules of streams of the top and bottom hemispheres creating a constant field of an electric charge is equal

$$\Delta\Phi = 0 \quad (46)$$

As we see a stream

$$\Phi_d = 2\pi \cdot r \cdot r_d \cdot E_m \cdot \int_{-\pi/2}^{+\pi/2} \cos^2(x)dx = \pi^2 \cdot r \cdot r_d \cdot E_m \quad (47)$$

and its negative analog creates a constant electric dipolar field.

Let's consider two more distributions of a field for comparison.

In distribution 2, as well as earlier we will clean dependence of a stream of a segment on a thickness of the layer creating electric field of a segment (weaker distribution).

In this case the created stream of electric field of a ring segment will be equal

$$d\varphi = E_m \cdot \cos(x) \cdot ds = E_m \cdot [2\pi \cdot r_d \cdot r \cdot \cos(x) + 2\pi \cdot r_d^2 \cdot \cos(x) \cdot \sin(x)] \cdot dx$$

$$(48)$$

And the total stream of electric field created by the top hemisphere is equal

$$\Phi_{+} = 2\pi \cdot r \cdot r_d \cdot E_m \cdot \int_{-\pi/2}^{+\pi/2} \cos(x)dx + 2\pi \cdot r_d^2 \cdot E_m \cdot \int_{-\pi/2}^{+\pi/2} \cos(x) \cdot \sin(x)dx =$$

$$4\pi \cdot r \cdot r_d \cdot E_m + 0 \quad (49)$$

Similarly, the total stream of electric field created by the bottom hemisphere is equal

$$\Phi_{-} = -\{2\pi \cdot r \cdot r_d \cdot E_m \cdot \int_{+\pi/2}^{+3\pi/2} \cos(x)dx + 2\pi \cdot r_d^2 \cdot E_m \cdot \int_{+\pi/2}^{+3\pi/2} \cos(x) \cdot$$

$$\sin(x)dx\} = -4\pi \cdot r \cdot r_d \cdot E_m + 0 \quad (50)$$

The difference between modules of streams of the top and bottom hemispheres creating a constant field of an electric charge is equal

$$\Delta\Phi = 0 \qquad (51)$$

Well and a stream

$$\Phi_d = 2\pi \cdot r \cdot r_d \cdot E_m \cdot \int_{-\pi/2}^{+\pi/2} \cos(x)dx = 4\pi \cdot r \cdot r_d \cdot E_m \qquad (52)$$

and its negative analog creates a constant electric dipolar field.

<u>In distribution 3</u> we will strengthen dependence of a stream of a segment on a corner x, suppose, that the stream is proportional $cos^3(x)$ - is proportional to a square of a thickness of a layer of a segment creating electric field (stronger distribution).

In this case the created stream of electric field of a ring segment will be equal

$$d\varphi = E_m \cdot cos^3(x) \cdot ds = E_m \cdot [2\pi \cdot r_d \cdot r \cdot cos^3(x) + 2\pi \cdot r_d^2 \cdot cos^3(x) \cdot sin(x)] \cdot dx \qquad (53)$$

And the total stream of electric field created by the top hemisphere is equal

$$\Phi_+ = 2\pi \cdot r \cdot r_d \cdot E_m \cdot \int_{-\pi/2}^{+\pi/2} cos^3(x)dx + 2\pi \cdot r_d^2 \cdot E_m \cdot \int_{-\pi/2}^{+\pi/2} cos^3(x) \cdot sin(x)dx = 8\pi/3 \cdot r \cdot r_d \cdot E_m + 0 \qquad (54)$$

Similarly, the total stream of electric field created by the bottom hemisphere is equal

$$\Phi_- = -\{2\pi \cdot r \cdot r_d \cdot E_m \cdot \int_{+\pi/2}^{+3\pi/2} cos^3(x)dx + 2\pi \cdot r_d^2 \cdot E_m \cdot \int_{+\pi/2}^{+3\pi/2} cos^3(x) \cdot sin(x)dx\} = -8\pi/3 \cdot r \cdot r_d \cdot E_m + 0 \qquad (55)$$

The difference between modules of streams of the top and bottom hemispheres creating a constant field of an electric charge is equal

$$\Delta\Phi = 0 \qquad (56)$$

Well and a stream

$$\Phi_d = 2\pi \cdot r \cdot r_d \cdot E_m \cdot \int_{-\pi/2}^{+\pi/2} cos^3(x)dx = 8\pi/3 \cdot r \cdot r_d \cdot E_m \qquad (57)$$

and its negative analog creates a constant electric dipolar field.

All three variants of distribution of a field possess the general law – the difference of a stream creating a constant field of an electric charge, is always equal to zero thanks to symmetry of a structure of an elementary particle.

The area of a surface of the top hemisphere creating the top electric field is equal

$$S_{+}= \int_{-\pi/2}^{+\pi/2} ds = 2\pi \cdot r \cdot r_d \cdot \int_{-\pi/2}^{+\pi/2} dx + 2\pi \cdot r_d^{2} \cdot \int_{-\pi/2}^{+\pi/2} sin(x)\, dx = 2\pi^2 \cdot r \cdot r_d +0 \tag{58}$$

The area of a surface of the bottom hemisphere creating the bottom electric field is equal

$$S_{-}= \int_{+\pi/2}^{+3\pi/2} ds= 2\pi \cdot r \cdot r_d \cdot \int_{+\pi/2}^{+3\pi/2} dx +2\pi \cdot r_d^{2} \cdot \int_{+\pi/2}^{+3\pi/2} sin(x)\, dx= 2\pi^2 \cdot r \cdot r_d +0 \tag{59}$$

The electric charge of an elementary particle created by a difference of these areas (and accordingly a difference of streams) is always equal to zero as

$$\Delta S = S_{+} - S_{-} = 0 \tag{60}$$

For all three distributions it has turned out

$$\Phi_{+} = \Phi_d \tag{61}$$

and

$$\Phi_{-} = -\Phi_d \tag{62}$$

The constant electric dipolar field is available.

The dipolar electric charge is defined by the relation Φ_d to S_d. For the first distribution will be

$$\Phi_d/S_d = \pi^2 \cdot r \cdot r_d \cdot E_m /(2\pi^2 \cdot r \cdot r_d)= 1/2 \cdot E_m \tag{63}$$

Or having substituted value for e received at calculation of electric field of the charged elementary particles, we will receive

$$Q_d = \pm (3/4) \cdot e \tag{64}$$

The same value as for the charged elementary particles has turned out.

Other distributions differ in factor a little. For distribution 2 ($Q_d = \pm (2/\pi) \cdot e$), and for distribution 3 ($Q_d = \pm (16/9\pi) \cdot e$).

As won't seem strange, but neutral elementary particles also possess electric field and accordingly dipolar electric charges. On the big distances this field is imperceptible, if don't guess their existence.

4.2. Structure of a constant magnetic field

The magnetic field of a neutral elementary particle ($Q=0$) consists of following areas:

– ring area with the power lines generating a field, lying in a plane of rotation of a particle (Figure 13 see). Power lines are directed in parallel a plane of rotation of a particle;

– areas of an external field had on distances much more radius of an elementary particle;

– areas of an internal field had on distances of an order of radius of an elementary particle.

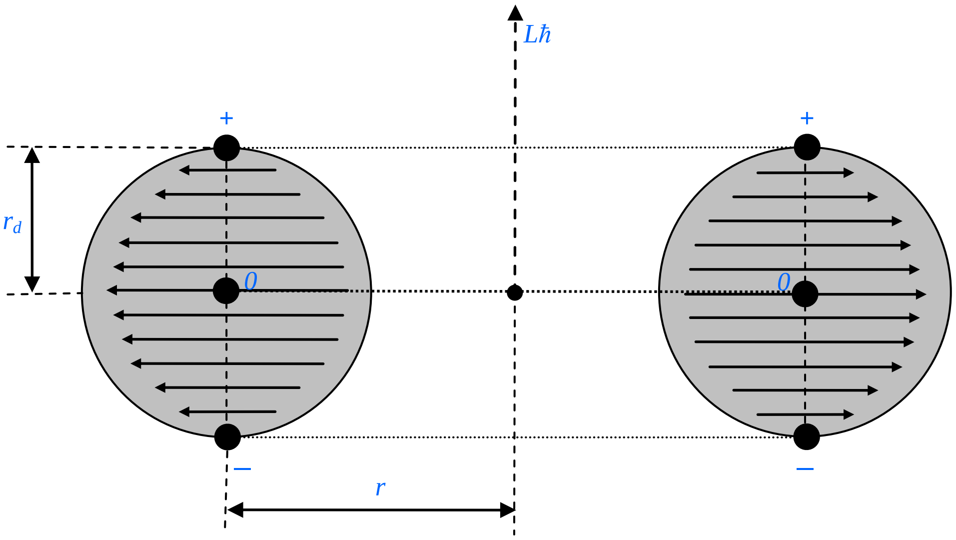

Figure 13 Cross-section of a magnetic field of a neutral elementary particle.

As well as in the previous cases, intensity of a magnetic field created by a segment is proportional to a thickness of a layer of a segment. Thus, the intensity maximum is reached in a particle plane. We will assume that there is such distribution of currents.

The magnetic field of a near zone of a neutral elementary particle is created by two distributed parallel currents (+ and –), with distance to a particle plane equal (r_d), identical size, radiuses (r) and an opposite direction.

The magnetic dipolar moment of the top current (we name it μ_{L+}) is equal

$$\mu_{L+} = (I/c) \cdot \pi \cdot r^2 = (I/c) \cdot \pi \cdot r_d^{\,2} \cdot (2L\,)^2 \qquad (65)$$

Similarly magnetic dipolar moment of the bottom current (we name it μ_{L-}) is equal

$$\mu_{L\,-} = (-I/c) \cdot \pi \cdot r^2 = -\,(I/c) \cdot \pi \cdot r_d^{\,2} \cdot (2L)^2 \qquad (66)$$

Both these of the magnetic moment are equal on size and is differ only a sign.

The magnetic dipolar moment of a particle as a whole is created by an internal ring current (0) radiuses (r) and is equal

$$\mu_0 = (I_0/c) \cdot \pi \cdot r^2 = f_0(M_L,L) \cdot e\hbar/m_0c \qquad (67)$$

This current creates an external magnetic field of a neutral elementary particle which is measured by means of devices. $f_0(M_L,L)$ it is possible to define function by means of quantum mechanics. As the simplified approximate replacement it is possible to use the following sedate function:

$$f_0(M_L,L) \approx (|M_L|/L)^{L/2} \cdot M_L/|M_L|$$

At neutron $M_L=-(3/2)$ a $L=\ (3/2)$ therefore the magnetic moment is equal $-e\hbar/m_{0n}c$ (increased by percent of energy concentrated in a variable electromagnetic field). At Λ^0 hyperon $M_L=-(1/2)$ and, hence, the magnetic moment will be approximately equal $-0.5 \cdot e\hbar/m_{0\Lambda}c$ (the energy percent here will be another). While there are no sufficient experimental data that it was possible to check up or specify dependence of the magnetic moment on quantum numbers.

As the size of the magnetic moment of an elementary particle is defined by percent of energy concentrated in a variable electromagnetic field the received value is necessary for increasing by the relation $m_{0\sim}/m_0$.

Now we can express μ_{L+} and μ_{L-} through $\cdot eL\hbar/m_0c$ received for the charged elementary particles considering $f_0(M_L,L)$.

$$\mu_{L+} = m_{0\sim}/m_0 \cdot f_0(M_L,L) \cdot [(I/c) \cdot\pi \cdot r_d^{\,2} \cdot(2L)^2]/[(I/c) \cdot 8\pi \cdot L \cdot r_d^{\,2}] \cdot eL\hbar/m_0c = m_{0\sim}/m_0 \cdot f_0(M_L,L)\cdot (L^2/2) \cdot e\hbar/m_0c \qquad (68)$$

$$\mu_{L-} = - m_{0\sim}/m_0 \cdot f_0(M_L,L) \cdot [(I/c) \cdot\pi \cdot r_d^{\,2} \cdot(2L)^2]/[(I/c) \cdot 8\pi \cdot L \cdot r_d^{\,2}] \cdot eL\hbar/m_0c = - m_{0\sim}/m_0 \cdot f_0(M_L,L)\cdot (L^2/2) \cdot e\hbar/m_0c \qquad (69)$$

It is necessary to substitute quantum number L, to receive the magnetic moments of the currents creating a constant magnetic field of neutral elementary particles.

What for the nature needed to enter the third current (0) and the magnetic field connected with it isn't clear yet. But in due time this current became a key to a solution of nuclear interactions.

5. ELASTIC INTERACTIONS OF ELEMENTARY PARTICLES

As a part of each elementary particle (except a photon) are available:

– A dipolar constant electric field;

– A dipolar constant magnetic field;

– A variable electromagnetic field.

First two fields don't rotate and submit to laws of classical electrodynamics.

The variable electromagnetic field continuously rotates on a radius ring $r=L\hbar/m_{0\sim}c$ with a velocity of light and submits to the quantum mechanics. It defines the sizes of elementary particles, sizes of electric charges and currents. It is responsible for all casual events and likelihood processes.

Classical electrodynamics in turn allows calculating interactions of constants electric and magnetic fields. But that it was possible to count, it is necessary to translate at first an elementary particle in system of electric charges and currents. To make it is necessary so that electric and the magnetic fields created by these charges and currents, as less as possible differed from the present fields of elementary particles that is uneasy.

To sizes of electric charges and the magnetic moments it is possible to add one more parameter. As intensity electric and magnetic water, created by dipolar charges and currents, it is proportional to a thickness of a layer of a segment (their creating) – that the energy density will be proportional to a square of a thickness of a layer of a segment (Figure 14 see).

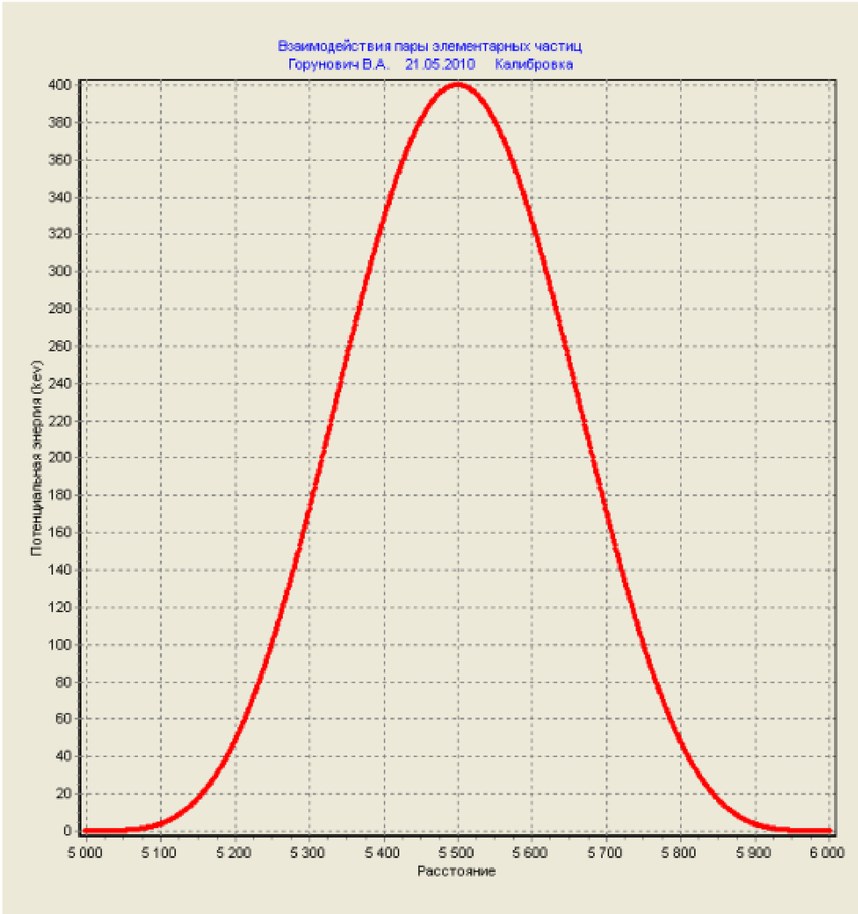

Figure14 Density of energy of a field of ring sphere.

Readout on a horizontal axis equal 5000 both 6000 correspond to the beginning and the end of area of generation of a field. In particular in these points the currents creating a magnetic field (if to consider a magnetic field) settle down. But if in these points to place simple thin currents we will receive the following density.

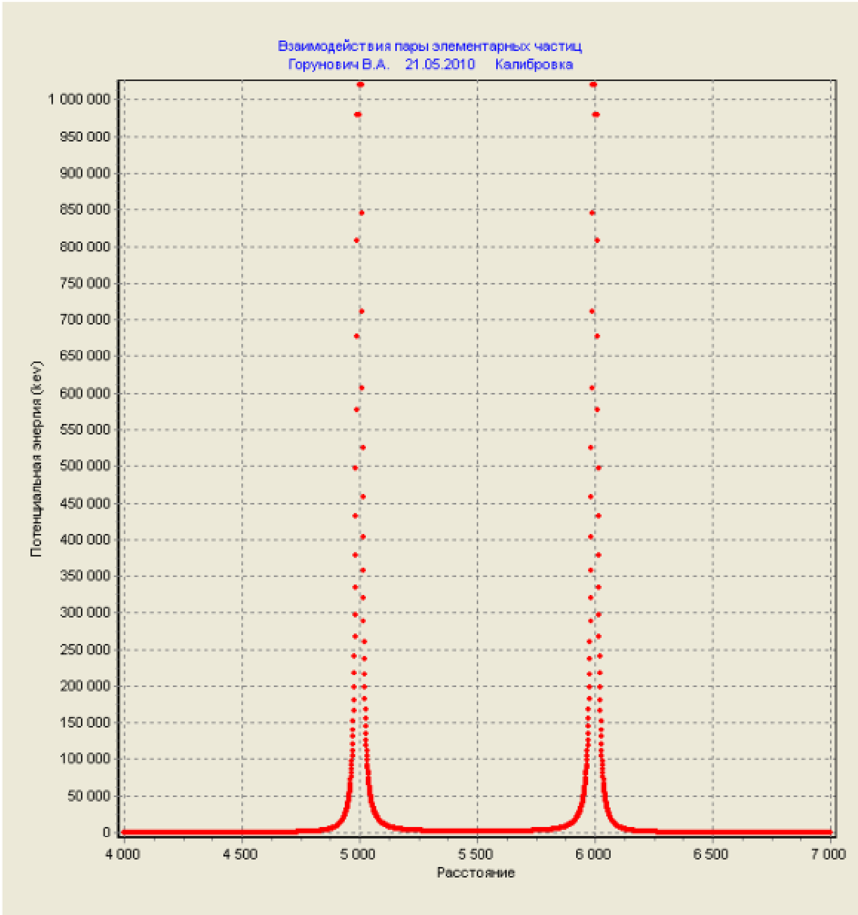

Figure 15 Density of energy of a field of thin currents.

If them to combine, the result of comparison will be not in favor of such replacement.

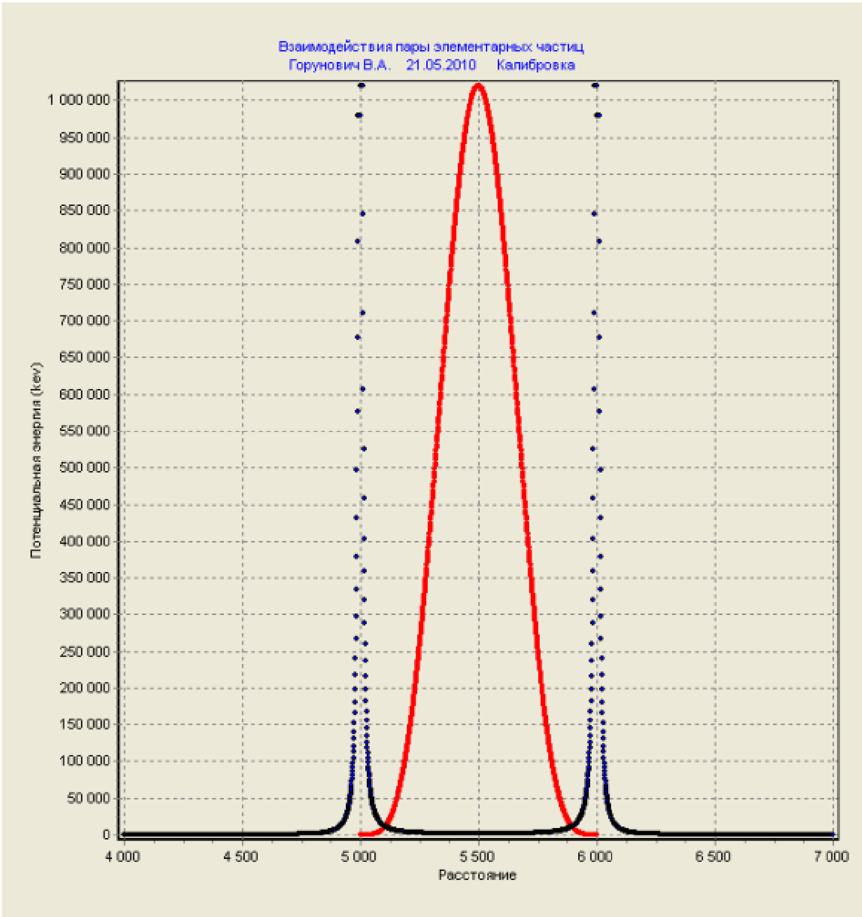

Figure 16 Density of energy of a field of ring sphere and thin currents.

And after all if a little to try, it is possible to receive and such result.

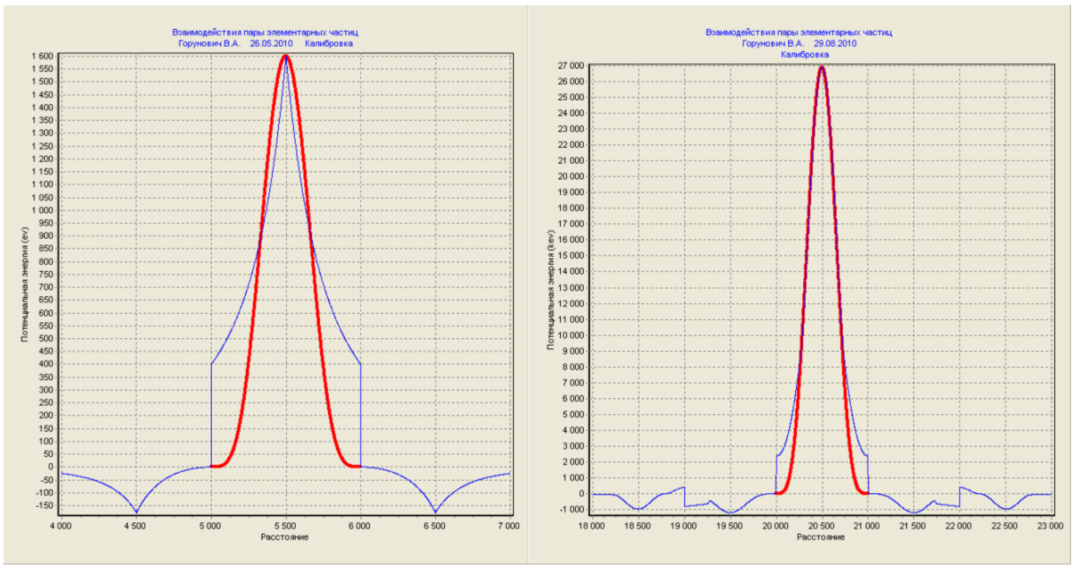

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Figure 17 Density of energy of a field of ring sphere and modeling currents (two variants of distribution). By a minus energy of sites of a field with an opposite sign on intensity (which in an elementary particle isn't present) is shown.

Not that has very much coincided, but already there is the general. And then we can receive such picture of nuclear interactions:

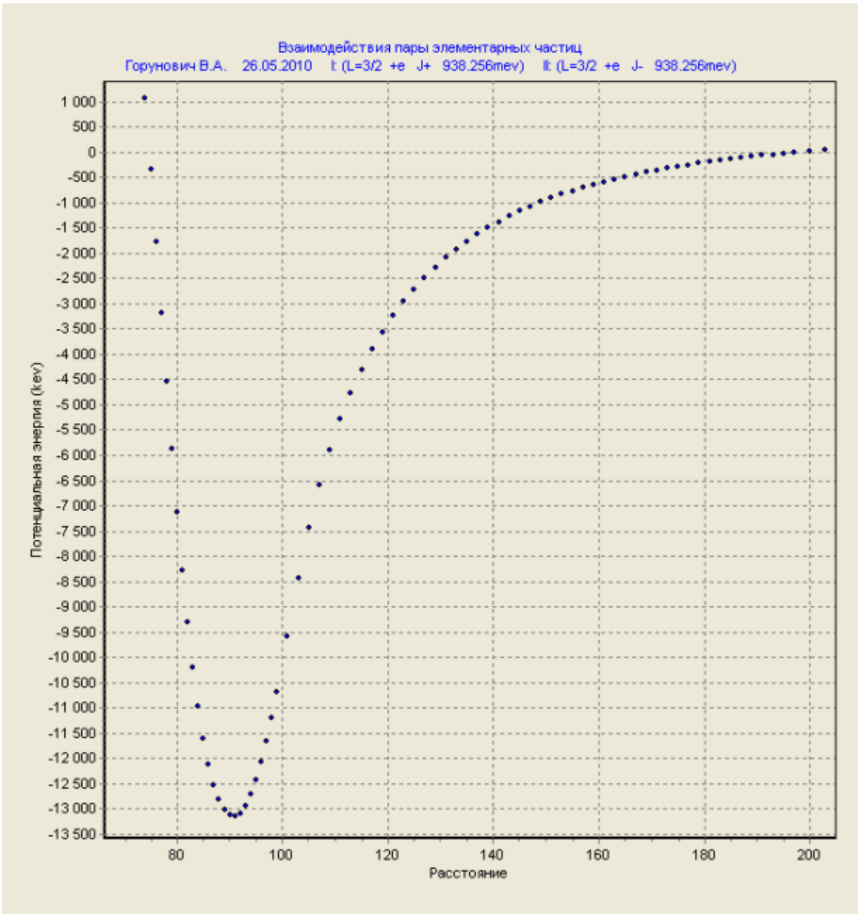


Figure 18 "Nuclear" interactions of a proton with a proton.

Or it is less detailed

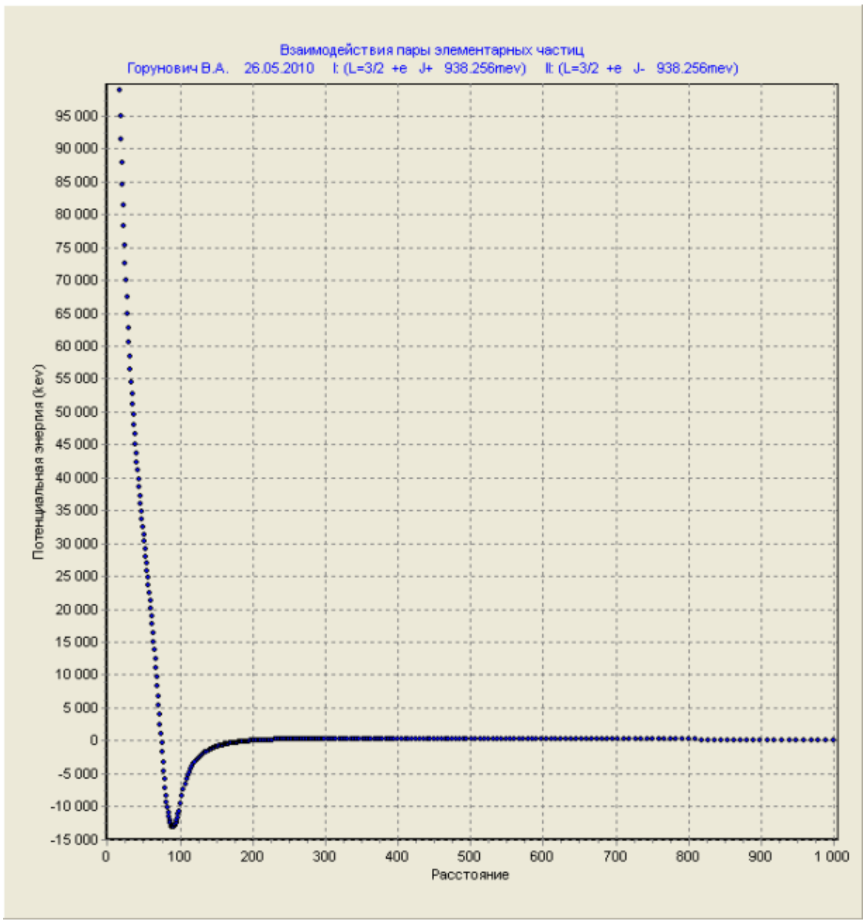


Figure 19 "Nuclear" interactions of a proton with a proton.

The distance 100 is corresponds 10^{-13}cm.

Here the second pair:

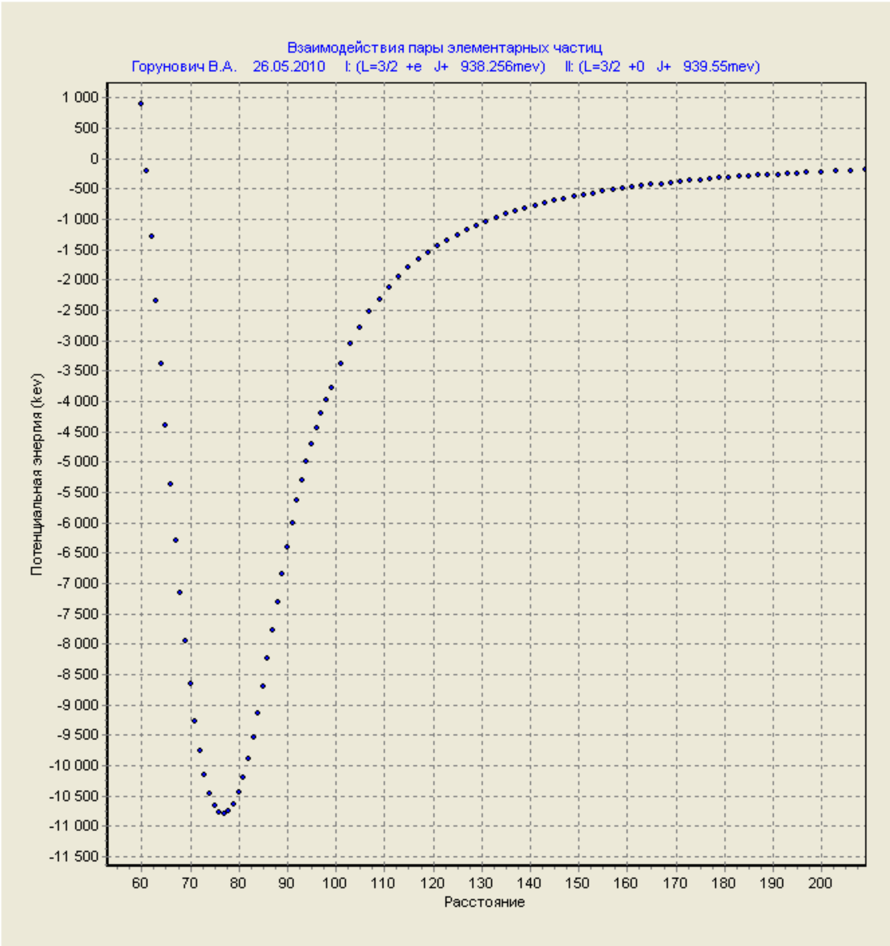


Figure 20 "Nuclear" interactions of a proton with a neutron.

Proton-proton and proton-neutron interactions difference a little, but and should be – fields after all different. And as to an exchange of "virtual" attics in infringement of laws of the nature – we will forget about this imagination and such "theories". Nature laws not us write, not submit to us and operate at any moment Δt.

And one is the interesting information. Here so interactions of electric fields of neutrons in a near zone (r <10^{-12}cm).

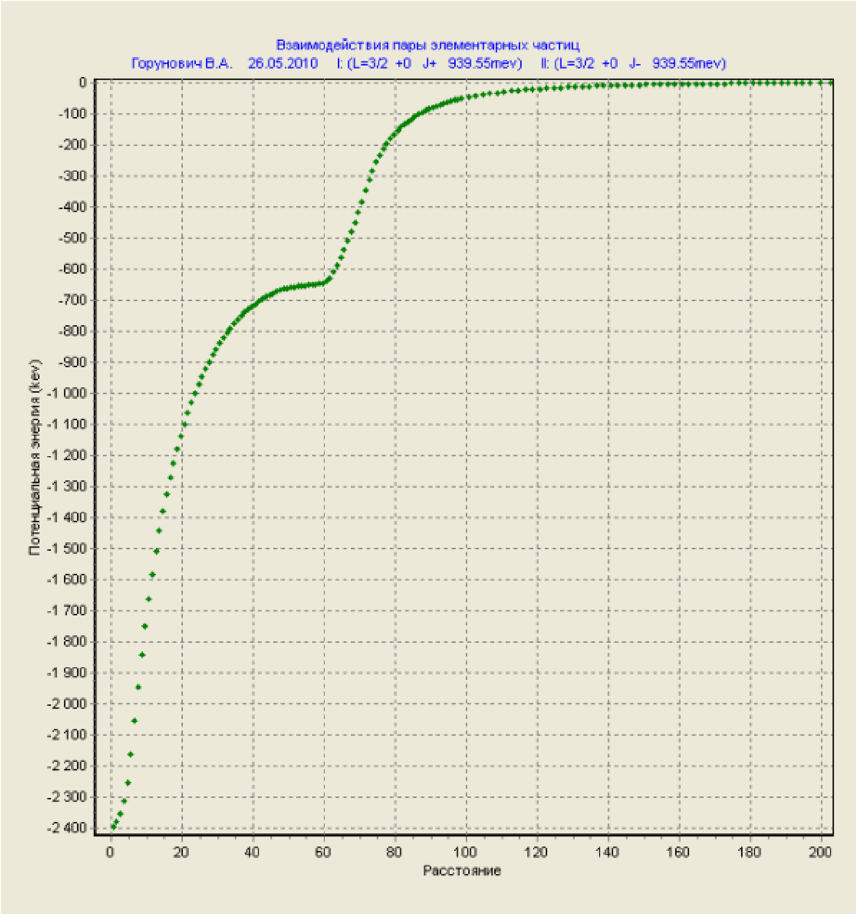


Figure 21 Interactions of electric fields of neutrons.

Absence of electric charges not a hindrance.

And so interactions of electric fields of protons look.

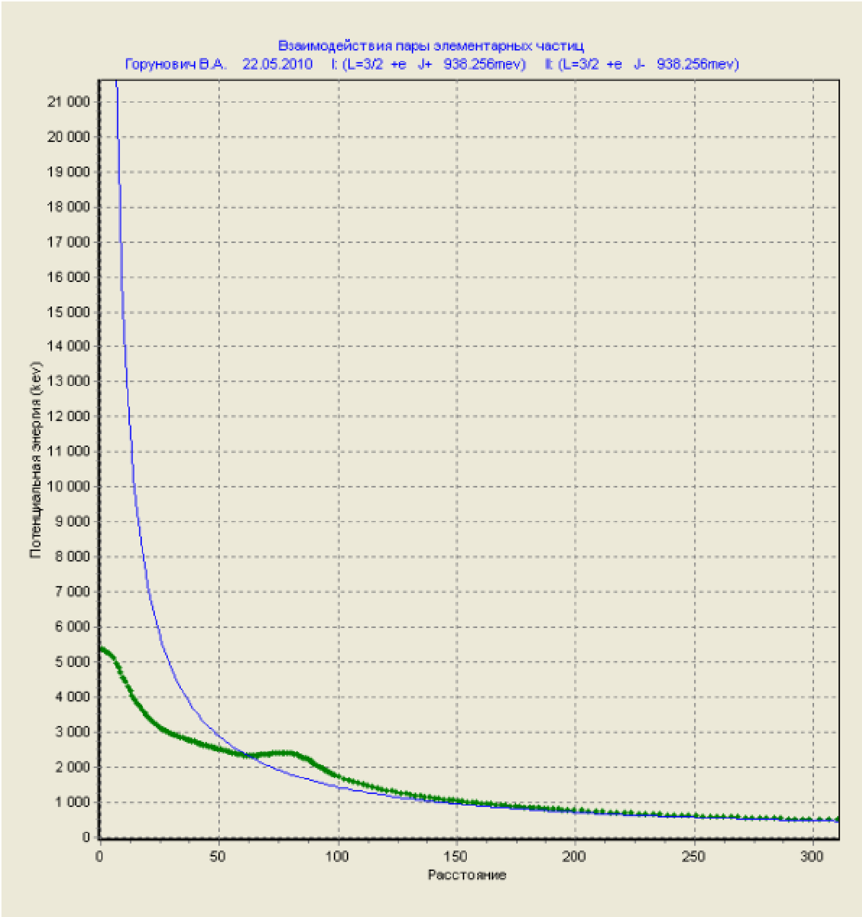


Figure 22 Interactions of electric fields of protons.

By thin line are shown coulomb interactions of dot electric charges, and a thick line – interactions of electric fields of protons. As we see, on distances it is less $2 \cdot 10^{-13}$cm electric interactions cease to be coulomb. Fields are dipolar.

Here interactions of electric fields of a proton and a neutron.

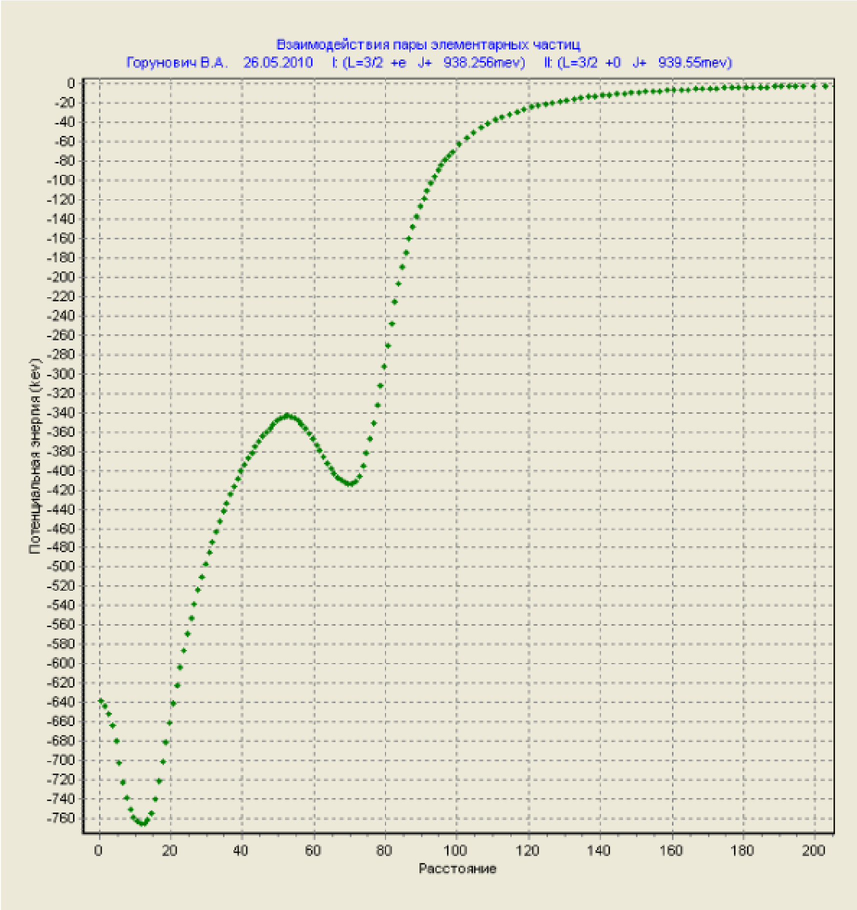


Figure 23 Interactions of electric fields of a proton and neutron.

And in general who has told that proton electric field coulomb up to distances 10^{-16}cm. It follows from electrons dispersion on protons? But then there is a question on the sizes electron. According to the field theory the linear sizes electron in 600 times more the sizes of a proton – naturally any structure of electric field of a proton we can't see. And all these fairy tales on the sizes electron less than 10^{-16} cm – anything with the validity have no general. Really so it is heavy to count, to that energy of electric field of a particle of such linear sizes is equal. I result calculations of energy of spherical electric field of radius (*R*).

$$We = \frac{1}{8\pi}\int_R^\infty E^2 dv = \frac{1}{8\pi}\int_R^\infty (e^2/r^4)\cdot 4\pi\cdot r^2 dr = \frac{4\pi}{8\pi}\cdot e^2\cdot\int_R^\infty (1/r^2)\cdot dr = \frac{1}{2}\cdot e^2/R \tag{70}$$

Let's substitute size of an elementary electric charge (e=4.803242 $\cdot 10^{-10}$ unit SGSE [2]) and also factor of recalculation of energy from erg in ev (1 erg =6.2419 $\cdot 10^{11}$ ev) we will receive

$$We = \frac{7.2 \cdot 10^{-8}}{R}, \text{ ev} \qquad (71)$$

radius R is measured in centimeters.

It is necessary to substitute R=10^{-16} cm and we will receive the minimum value of weight of rest such super heavy electron 720 Mev.

It turns out that atom of hydrogen became heavier almost twice and who round whom rotates now. How then to be with spectra of atoms and sizes of their weights? Can will suffice to manipulate laws of the nature and to compose the fairy tales, what beautiful they wouldn't seem. The mathematics shouldn't substitute for itself the physics. The mathematics offers set of decisions from which the nature could not choose any.

And here so electric field electron proton eyes actually look.

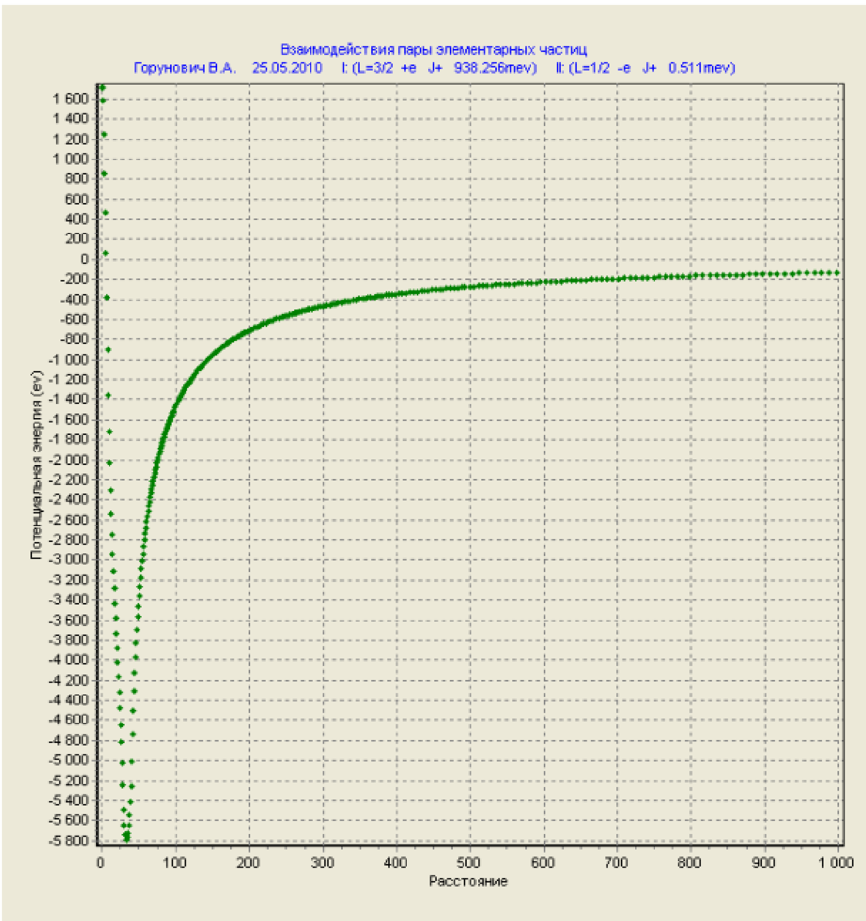


Figure 24 Interactions of a proton with electron.

The distance 100 is corresponds 10^{-11} cm. It isn't that so interesting? As we see electric field electron is coulomb, but only to distances 10^{-11} cm. And from distances $3.5 \cdot 10^{-12}$ cm in general there are less changes a sign.

And so interactions π^+ - meson look.

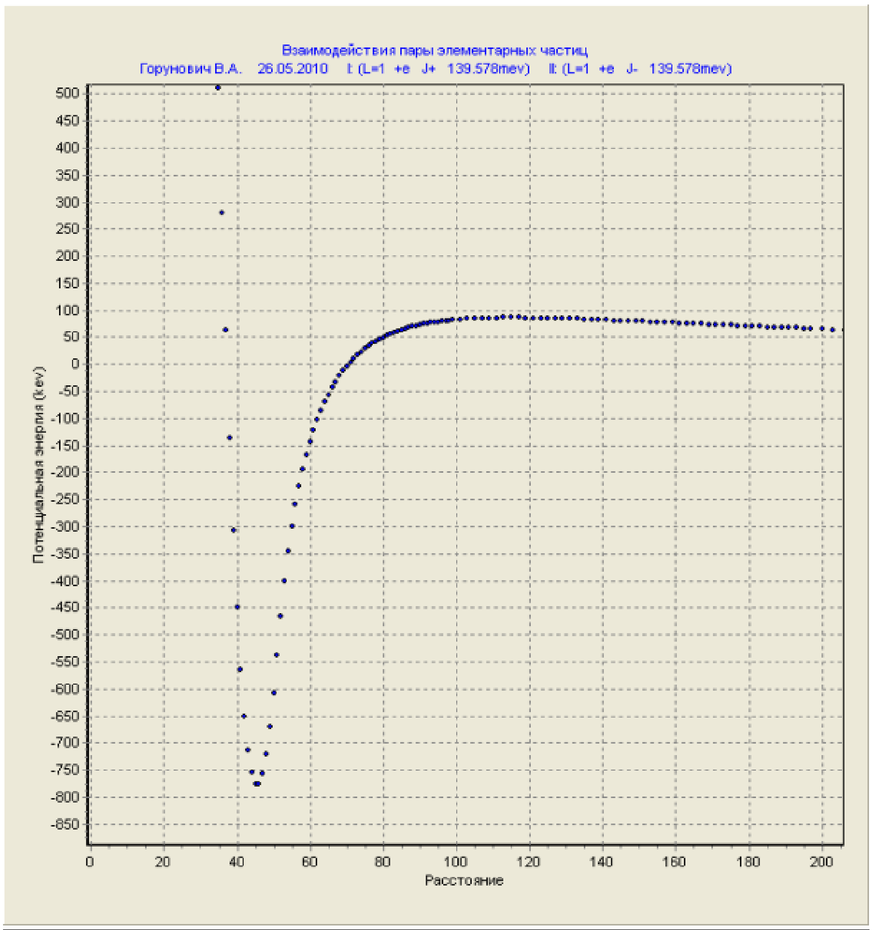


Figure 25 Interactions π^+ - mesons.

The distance 100 is corresponds 10^{-12} cm. As is visible strong interactions on the person.

And at business muons are differently.

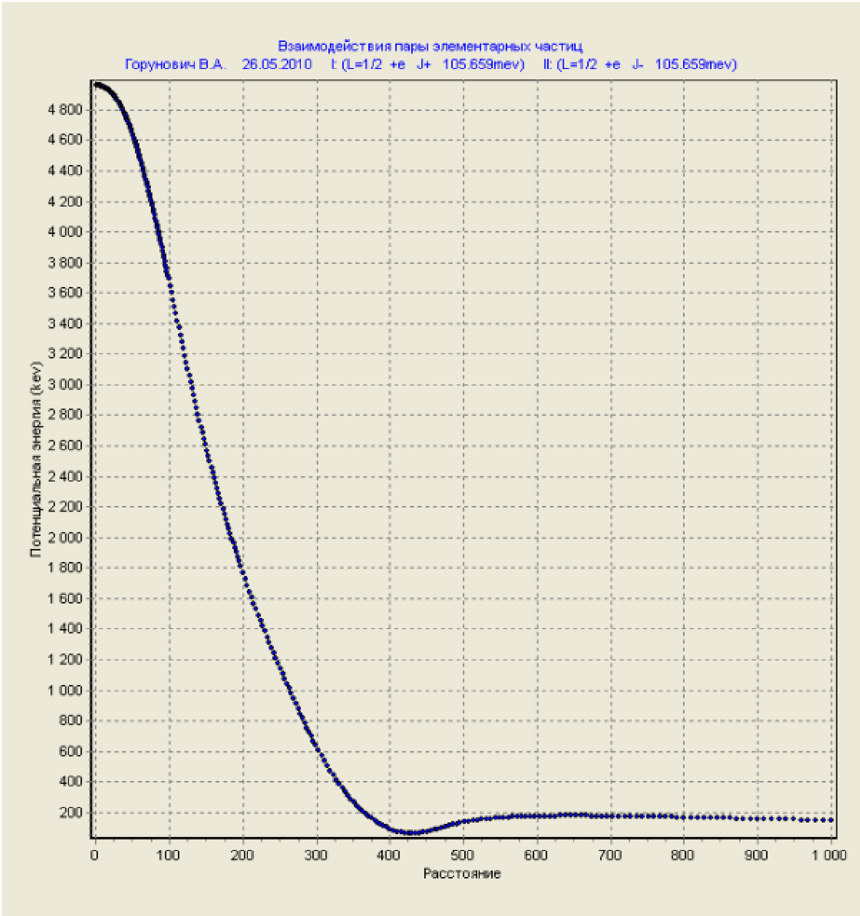


Figure 26 Interactions of muons.

The distance 100 is corresponds 10^{-13} cm. Holes aren't present. It won't be and at pair electron.

And here still interactions of external magnetic fields of neutrons.

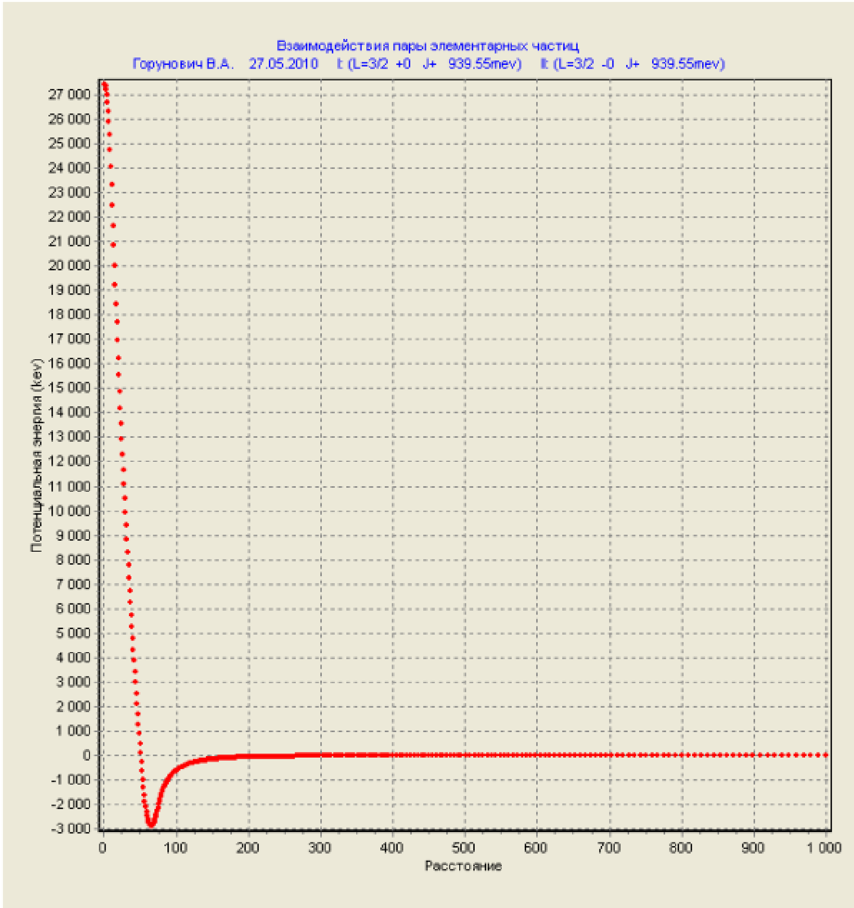


Figure 27 Interactions of external magnetic fields of neutrons.

We distinctly see one of a component of nuclear interactions. In a distant zone it decreases under the law $1/r^3$, as well as interactions of ring currents.

Thus nuclear interactions are basically interactions of constant magnetic fields of nucleons in a near zone. The smaller contribution (approximately on an order) in them is brought also by interactions of constant electric fields.

And here is how look interactions of the biggest elementary particle ($L>0$) - electronic neutrino with the elementary atomic nucleus – a proton. The weight of rest neutrino is taken by equal 30 ev.

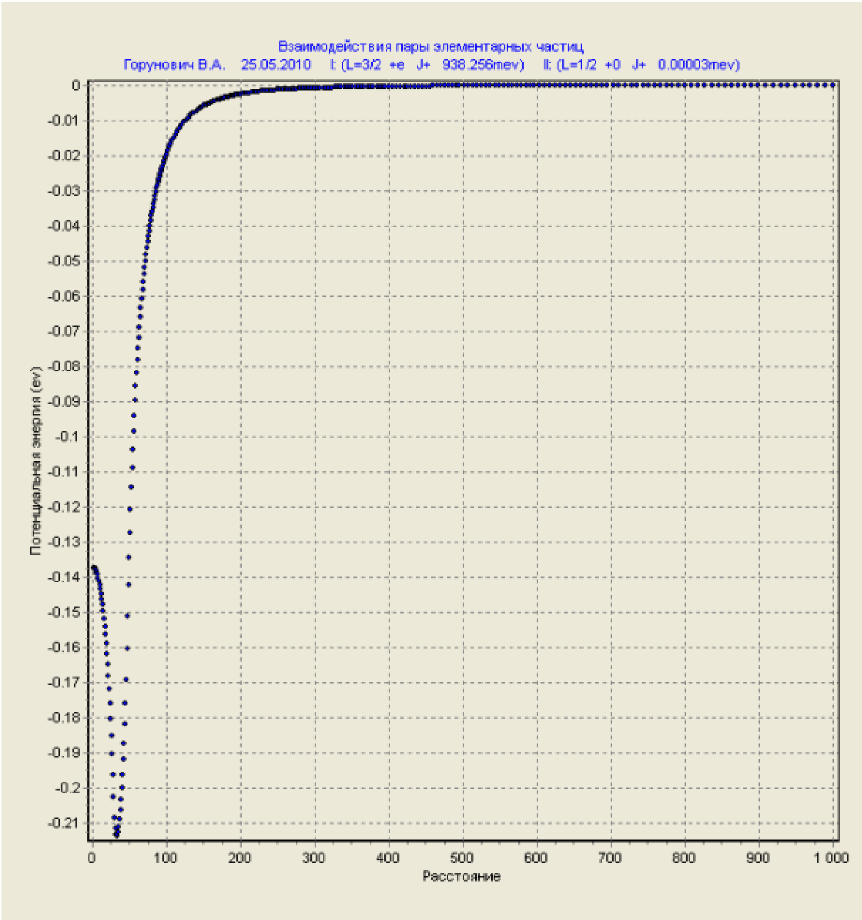


Figure 28 Interactions of a proton with electronic neutrino.

The distance 100 is corresponds 10^{-6} cm. As we see in this hole, rather not deep, one atom and not only hydrogen can be located not.

Well and at last, interactions of the most imperceptible elementary particles with each other.

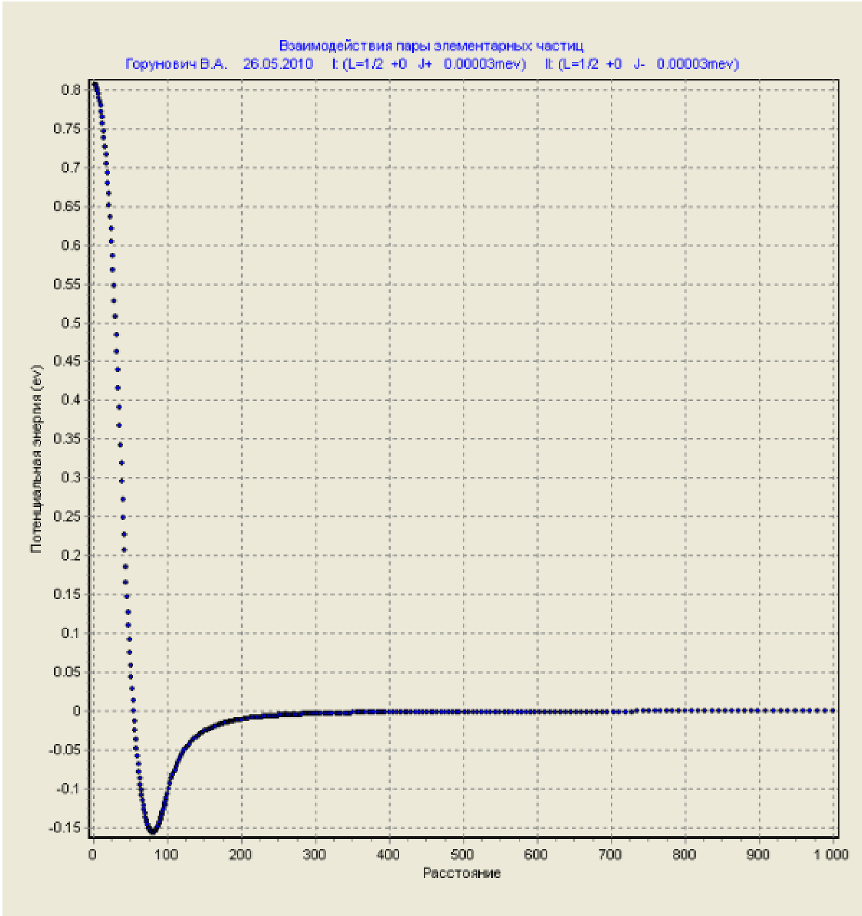
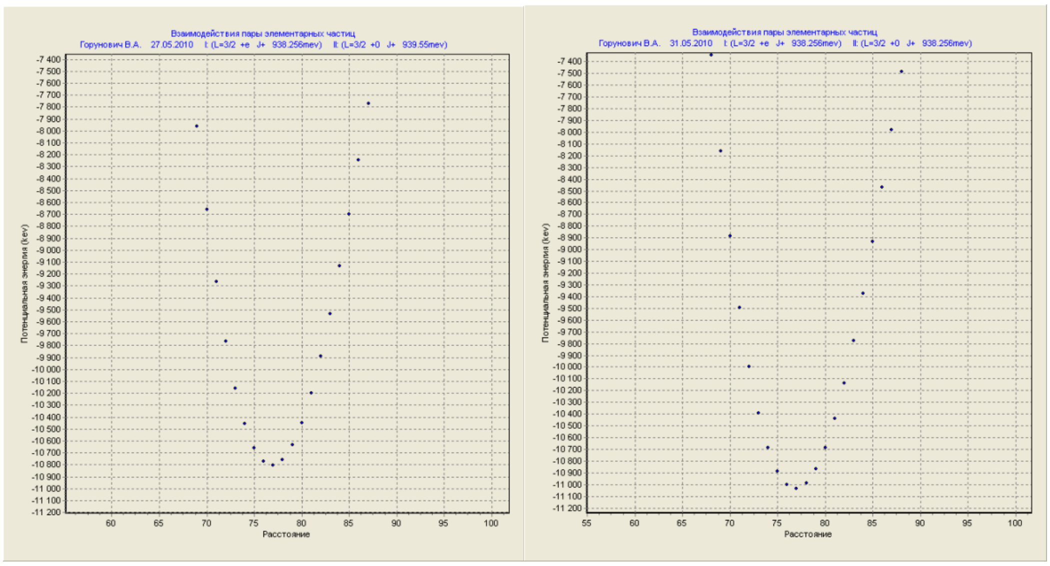


Figure 29 Interactions electronic neutrino.

When there are constants electric and magnetic fields – will be also their interactions. For the present nobody cancelled nature laws.

All calculations were spent on the basis of distribution 1 (Figure 17). The given distribution gives size of the magnetic moment of a neutron 0.95855$e\hbar/m_{0n}c$ (the deviation from experimental data makes 0.07%) and a proton 1.3976$e\hbar/m_{0p}c$ (the deviation from experimental data makes 0.08%). The second distribution gives very similar picture, a bit different depth of holes.



1 2

Figure 30 Interactions of a proton with a neutron in a near zone (two distributions).

As we see, character of schedules hasn't changed. The matter is that distribution 2 gives values of the magnetic moments much more exact. So the magnetic moment of a neutron will be equal 0.957839 $e\hbar/m_{0n}c$ and a proton 1.396424 $e\hbar/m_{0p}c$ (or accordingly in nuclear magnetons 1.913041 and 2.792848). Closer distribution can give more exact values of the magnetic moments. But it is necessary to consider that accuracy of measurement of weights of rest of elementary particles is insufficient. To avoid charges I took less exact distribution.

The presented schedules and many other things about what I haven't had time to tell yet is received with use of field model of elementary particles – but it is already separate theme.

6. THE CONCLUSION

So, in the first part substantive provisions of the field theory of elementary particles have been formulated, quantum numbers are defined and the spectrum of elementary particles and their raised conditions is received.

In the present part the structure of fields of elementary particles and the mechanism of their formation is described. It allows calculating interactions of elementary particles, including the nuclear.

From the stated theory follows that in a microcosm the quantum mechanics and classical electrodynamics simultaneously work. Between them there is no contradiction – simply they see in elementary particles everyone them.

In spite of the fact that it was not possible to find answers to all questions (as should happen) nevertheless, it is possible to assert that **the field theory of elementary particles developed on the basis of ideas classics, and also the quantum mechanics henceforth exists!**

Vladimir Gorunovich

8/27/2010

Changes of 7/20/2011

7. THE LITERATURE

1. Albert Einstein. Meeting of proceedings volume 2, M: the Science, 1966 with. 154.

2. Tables of physical sizes, a directory under the editorship of I.K.Kikoina, Atomizdat, Moscow (1976).