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 on the Internet or any publishing house in 2011-2012 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 интернете или любом издательстве в 2011-2012 годах с обязательным указанием первоисточника.

Владимир Горунович.

17.05.2011

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

Part 1

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».

Now we are actually compelled to distinguish "matter" and "fields" though we can hope that future generations will overcome this dualistic representation and will replace with its uniform concept as it the theory of a field of our days vainly tried to make.

Albert Einstein [1]

To my teachers of physics it is devoted

THE SUMMARY

The fragment of the field theory of elementary particles is developed. The made assumptions explain: a structure of elementary particles, the nature of their fields, all spectrum of elementary particles and their conditions, laws to which they submit, the present quantum characteristics and their derivatives, the magnetic moment of the charged particles (with any spin), presence of an electric dipolar field at neutral particles etc.

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

1. INTRODUCTION

We take Einstein's formula ($E = m_0c^2$) and it is applicable it to one separately taken elementary particle. We will receive that the internal energy concluded in an elementary particle is equal to product of weight of rest on a square of a velocity of light. Or translating from a mathematical language on language of physics and having remembered that light consists of quanta of an electromagnetic field, we can draw the following conclusion: In an elementary particle there is some distributed weight (we name it $m_{0\sim} \approx m_0$) rotating with a speed of quantum of an electromagnetic field (c). Hence should be and the rotary moment equal m_0cr (where r – average radius of rotation). We quantize it multiple $\hbar/2$ (where $\hbar$ - Planck's constant) and we will consider that particle spin (its rotary moment) can be result of several rotations. Having connected all it with an electromagnetic field and having made on a course some specifying assumptions as a result it is possible to receive the following.

2. POSTULATES

1. Each elementary particle, except for a photon, is a certain condition of the polarized variable electromagnetic field rotating with a velocity of light from a constant component (figure 1 see).

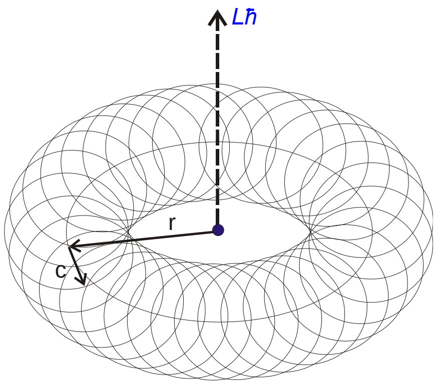

Figure 1 Schematic image of an elementary particle.

2. In environment the given field induces following constant fields:

- Quantum electric field (E);

- A quantum magnetic field (H);
- An external magnetic field of neutral elementary particles (H_0) – a field of a ring current of radius $r=L\hbar/m_0c$ (item 3 see).

Weight of rest of an elementary particle (m_0), and also the gravitational field connected with it are defined by energy (W) the sums of this field, including a variable electromagnetic field.

$$m_0 = W/c^2 \qquad (1)$$

3. To each elementary particle the following **three of quantum numbers** is unequivocally put in conformity:

L – the main quantum number - the internal rotary moment of the elementary particle, accepting the following set of values:

$L = 0;\ ^1/_2;\ 1;\ ^3/_2;\ 2;\ ^5/_2;\ 3;\ \ldots$..

M_L – the quantum number responsible for division of particles on subgroups and accepting following values:

$M_L = -L; -L+1; \ldots ; L-1; L$ - all $2L+1$ value;

Q – the quantum number which is responsible for an electric charge and a direction of power lines of a quantum magnetic field of neutral particles (in outside «$+0$», in inside «-0»):

$Q = \pm e; \pm 0$.

Splitting on quantum number Q is a consequence of that four polarizations of an electromagnetic field in relation to the internal rotary moment (see figure 2) are possible only. Rotation can be carried out or in a plane of an electric component of a field, or in a plane of a magnetic component. In the first case the pair of the charged particles ("particle" and “antiparticle”), different a sign on an electric charge and a sign on the magnetic moment (to tell electric more precisely and magnetic water) will turn out. In the second case the pair of the neutral particles, different a sign on a magnetic field and a sign on dipolar electric field will turn out.

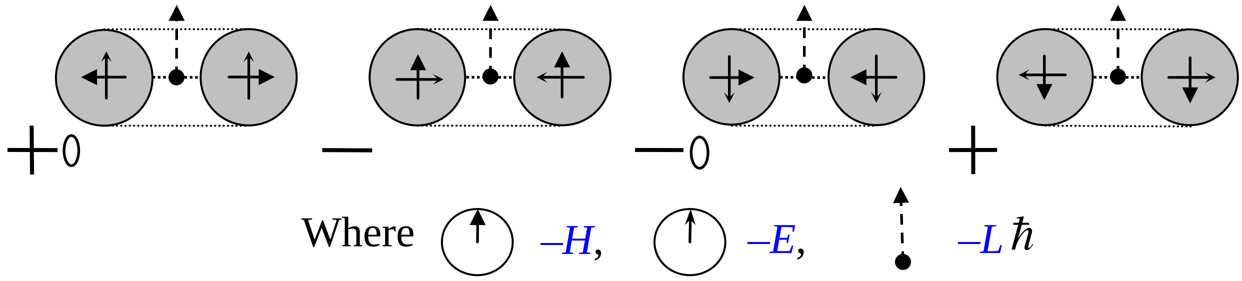

Figure 2 Cross-section of elementary particles (4 variants of polarization).

External display of the internal rotary moment (L) is spin (J) an elementary particle connected with L a following parity

$$J = \begin{cases} 1 - L\,; & L <= 1 \\ L - 1\,; & L >= 1 \end{cases} \qquad (2)$$

In turn, the internal rotary moment of an elementary particle is equal

$$L\hbar = m_0 c r$$

From here

$$r = L\hbar \,/\, m_0 c \qquad (3)$$

Thus, "r" it is possible to consider as average radius of rotation of a variable electromagnetic field and "c" as the average linear speed equal by definition of a velocity of light. We name "r" **radius of an elementary particle**.

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4. Elementary particles with $L>0$ can be and in wild spirits, different from the core presence of the additional rotary moment (V). The additional rotary moment (V) is multiple $\hbar$, is the **fourth quantum number** and can accept the following set of values:

$$V = \begin{cases} 0; +1; +2; +3; \ldots \\ -1; \ldots; \quad |V| <= |L| \end{cases} \qquad (4)$$

Where $V = 0$ means that the particle is basically (unexcited) a condition, the sign «+» means that directions of the additional rotary moment and the internal rotary moment coincide, and the sign «–» means that their directions are opposite.

Thus, spin of the raised condition of an elementary particle differs from a back of the basic condition and it is equal

$$J= \begin{cases} (L+V)-1; & (L+V)>=1 \\ 1-(L+V); & (L+V)<=1 \end{cases} \qquad (5)$$

The raised condition the back has other values, weights of rest, the magnetic moment, time of life and it can be accepted for other particle.

In the raised condition the elementary particle can pass as a result of collision with other particles. After certain time the elementary particle will pass in conditions with smaller energy (probably, including in the basic condition) according to point 5.

5. All transitions (reactions) between elementary particles, irrespective of their condition – the basic or raised, are carried out by means of other elementary particles and submit to laws of conservation of energy, an impulse, a back (the rotary moment), and also to laws of an electromagnetic field as they are electromagnetic processes. As laws of an electromagnetic field we take the modified equations of Maxwell.

$$\begin{cases} div\ E = 4\pi\rho \\ rot\ E = -\dfrac{1}{c}\dfrac{\partial B}{\partial t} \\ div\ B = 0 \\ rot\ B = \dfrac{1}{c}\dfrac{\partial E}{\partial t} + \dfrac{4\pi}{c}(\rho v + j) \end{cases} \qquad (6)$$

j - a source of a magnetic field of elementary particles.

Here in last equation it is added j, reflecting that fact that the magnetic field arises not only owing to movement or electric field change.

Character and speed of course of transition (reaction) of elementary particles are defined by a condition of variable electromagnetic fields of participating particles, and also conditions in which the given particles are. Influencing an elementary particle it is possible to accelerate or slow down this or that transition.

So, in the base of the field theory of elementary particles lie the quantum mechanics (without virtual particles) and classical electrodynamics supplementing each other. It was necessary to refuse virtual particles, as they deny action of laws of the nature and by that contradict classical electrodynamics. That the nature has found instead of virtual particles, it will be visible in the second part of the theory.

3. THE SPECTRUM OF ELEMENTARY PARTICLES AND THEIR CONDITIONS

All elementary particles are subdivided into groups on quantum number L, constant in group.

In turn, each group is subdivided on $2L+1$ a subgroup on quantum number M_L. In each subgroup with $L>0$ with set quantum number V exists two power levels, different presence of an electric charge.

Each power level is split on two conditions of "particle" and "antiparticle", different by a sign on an electric charge or a sign on the magnetic moment. Power levels with $L=1$ aren't subject to splitting only and $Q=0$, as because of zero a back the sign on the magnetic moment (μ_L) and an electric dipolar field becomes uncertain is π^0, K^0 and η^0 mesons.

Fragment of a spectrum of the basic conditions of elementary particles (quantum number $V=0$) see figure 3.

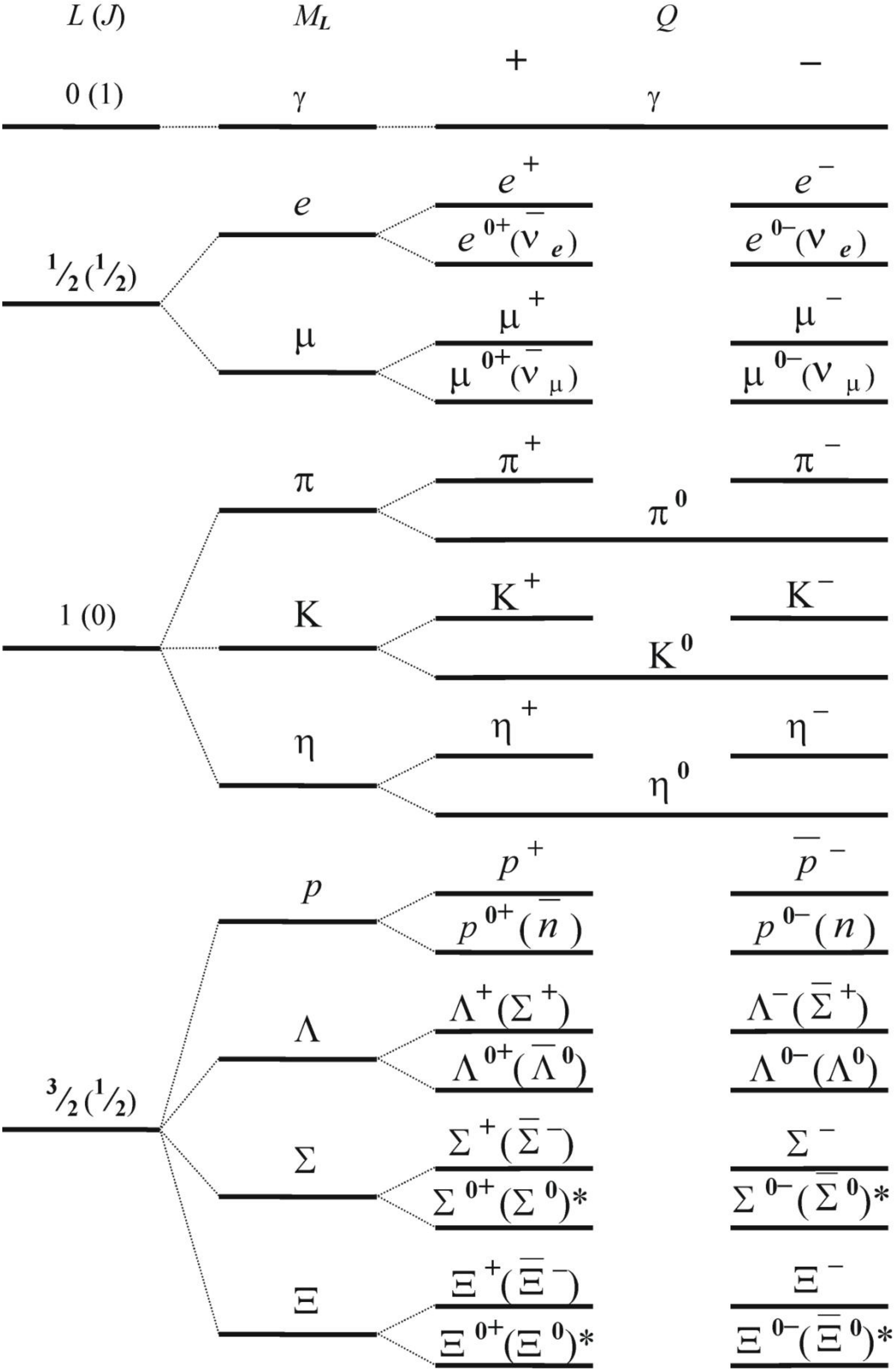

Figure 3 Fragment of a spectrum of the basic conditions of elementary particles (quantum number V=0).

*The symbol * marks elementary particles, the sign on which magnetic moment isn't established yet.*

As historical names of particles often don't correspond to the theory, in figure the designation of power level corresponding to a particle (following of the theory), and then in brackets the historical name of a particle (if it differs) at first is given.

As has historically developed to name elementary particles the particles which are in the basic condition (the particles which are in wild spirits, often name resonances) further elementary particles will be meant as the basic condition of particles, and there where the raised conditions will be considered, will specially make a reservation.

Potential number of elementary particles and their conditions is infinitely.

All elementary particles with $L>0$ possess weight of rest distinct from zero. The unique elementary particle possessing in zero weight of rest, the photon (γ), as at photon $L=0$ is.

The law of preservation of an electric charge, convertibility and charging symmetry of reactions follow from the equations (6) (so-called charging symmetry T and C) etc.

Let's consider some elementary particles.

The easiest stable elementary particle (and antiparticle) with nonzero weight of rest is electronic neutrino (ν_e), quantum numbers - $L={}^1/_2$, a subgroup e, $Q=0$. Its disintegration contradicts the law of preservation a back. Extremely small size of weight of rest and the big radius complicate its interactions with other elementary particles. But at neutrino, as well as any neutral elementary particle with $L>0$, has two macro fields - an electric dipolar field and a magnetic field by means of which it can cooperate with other fields.

The following elementary particle (and antiparticle) the given subgroup is electron (e). It also is stable, because its disintegration contradicts the law of preservation of an electric charge. Its magnetic moment is approximately equal to product of an elementary electric charge on particle radius. For electron it will be

$$\mu_{Le} = er_e = eL_e\hbar /m_{0e}c = e\hbar /2m_{0e}c$$

As the magnetic moment of elementary particles isn't connected with spin it is necessary to measure it in units of the magnetic moment, namely $e\hbar/m_0c$ (where m_0 - weight of rest of a corresponding particle).

Radius electron according to the formula (3) r_e = $1.93*10^{-11}$ cm that in ten times more the sizes of the biggest atomic nucleus. To compress electron till the sizes of a proton according to the equations (6) and (3) energy in six hundred times surpassing internal energy electron is necessary. Therefore insert electron in a kernel it is very heavy. It simply will pass through a kernel or will jump aside from it, cooperating with electric field, but to fall to a kernel electron can't in any way. Electron it not a material point, and a field. To compress atom till the sizes of its kernel, energy not less Z•312 Mev (Z – number electrons in atom) is necessary.

The following subgroup with $L={}^1/_2$ is the subgroup μ, including following particles: $\bar{\nu}_\mu$, ν_μ , μ^+ , μ^- . All elementary particles of the given subgroup are astable, as for everyone there are disintegration channels.

The easiest particle of a subgroup is muonic neutrino (ν_μ). As muonic neutrino it is easier electron (the overshoot of power levels of different subgroups here takes place) for neutrino following channels of disintegration are possible:

$$\nu_\mu \rightarrow \begin{cases} \nu_e + \nu_e + \bar{\nu}_e \\ \\ \nu_e + n\gamma,\ n = 1,2,3,4\ldots. \end{cases}$$

And, at last, the heaviest elementary particle of group $L={}^1/_2$ is the muon (μ). Its weight of rest is equal 105.659 Mev, and the radius accordingly $9.3\cdot10^{-14}$ cm. The sizes of a muon are comparable to the sizes of nucleons.

It is necessary to notice also that τ - the lepton is the raised condition of a muon (μ) with quantum number V=+1.

The following group of elementary particles is the group mesons $L=1$, including three subgroup π, K and η. Each subgroup consists of two charged particles and one neutral. Thanks to zero size the back of particles of the given group (follows from the equation (2)) becomes impossible splitting of power levels with a zero electric charge on particle and antiparticle conditions (the sign on the magnetic moment is uncertain). On the other hand, the zero size a back allows these particles to participate in many reactions.

All charged elementary particles of the given group, despite zero spin, should possess the magnetic moment created by a quantum magnetic field approximately equal

$$\mu_L = er = eL\hbar /m_0c = e\hbar /m_0c$$

On the other hand, all neutral elementary particles, as well as particles of other groups, despite lacking an electric charge on the big distances, should possess dipolar electric field. It follows from polarization of an electromagnetic field in a particle and the equations (6).

So, the easiest subgroup is the subgroup π - mesons (π^+, π^-, π^0) – only three particles, different an electric charge. All of them well-known, and it is difficult to add something, besides, that they aren't «carriers of strong interactions» however, as well as the others mesons.

The following subgroup is subgroup K - mesons (K^+,K^-,K^0) – as three particles. Splitting K^0 – meson on K^0_S and K^0_L is absent, as there is no sign on which there can be such splitting, K^0 – attics it is one elementary particle.

Last subgroup is the subgroup η - mesons (η^+, η^-, η^0) – as three particles. Here doesn't suffice charged η^+ and η^- mesons. Their weight of rest will slightly differ from η^0 meson, and disintegration channels same, as at K^+ and K^- mesons accordingly.

The following group of elementary particles is the group of baryons $L={}^3/_2$, including four subgroups p,Λ,Σ и Ξ. Each subgroup consists of four particles: two charged and two neutral. (Nuclear interactions will be considered in the second part).

If the magnetic moment of a proton to divide on 3, we will see that it differs from unit on 0.069, instead of on 1.7928.

It is necessary to notice also that Ω^- hyperon is the raised condition Ξ^- hyperon with quantum number V=+1.

The following group of elementary particles is the group vector mesons L=2, including five subgroups. Each subgroup consists of four particles - two charged and two neutral. As many particles of the given group for the present aren't opened, we will shortly consider one of subgroups, for example $D*$- mesons ($D*^+$, $D*^-$,$D*^0$, $\bar{D}*^0$ figure 4 see). All other subgroups will be same.

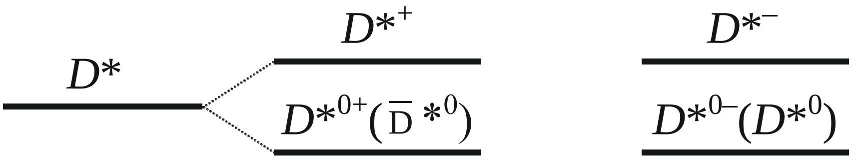

Figure 4 Subgroup $D*$- mesons

As we see, each "particle" has "antiparticle". Parity the back of particles, and also the big energy facilitate their disintegration so, and reduce life time. Channels of disintegration of particles will differ from meson with L=1.

All subsequent groups of elementary particles with whole L will be also vector attics and so indefinitely.

It is necessary to notice also that «lepton and baryon charges» are interconnected – from one another follows.

The raised conditions of elementary particles, also as well as the basic conditions, it is possible to divide into groups and subgroups as the basic condition is only a special case. Within group all subgroups have identical structure and change only at transition from one group to another. Therefore it is enough to consider any way chosen subgroup from each group.

In figure 5 the core and a part of the raised conditions of a subgroup of a muon (μ, $L={}^1/_2$), are presented. As we see, all of them are symmetric (at each "particle" there is "antiparticle"). Thus there are two sets of conditions with spin ${}^1/_2$ - the basic (μ) and the first rose (τ - lepton), and also on one set of conditions with spin ${}^3/_2$, ${}^5/_2$ etc. Potential number of such sets infinitely and all of them is «leptonic».

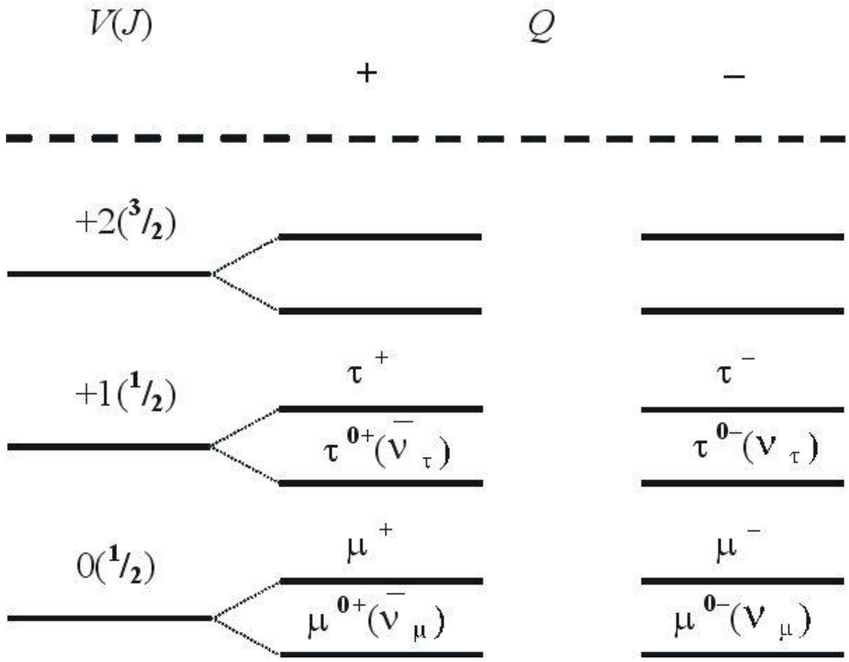

Figure 5 Conditions of a subgroup of a muon (μ).

Otherwise look subgroup conditions π - meson (L=1), presented on figure 6. As zero spin of the basic condition has blocked splitting of power level π^0 on "particle" and "antiparticle", and the additional rotary moment (V) can't unblock it we will receive a series of sets on three conditions - two symmetric charged and one neutral. Thus two sets of conditions with V=+1 and V=–1 have identical spin J=1. And further, as it is necessary, indefinitely. It is necessary to notice that particles: r'^{+}, r'^{-} and r'^{0} with weight 1600 Mev most likely are the raised conditions of a subgroup η - meson with V=+1 or V=–1.

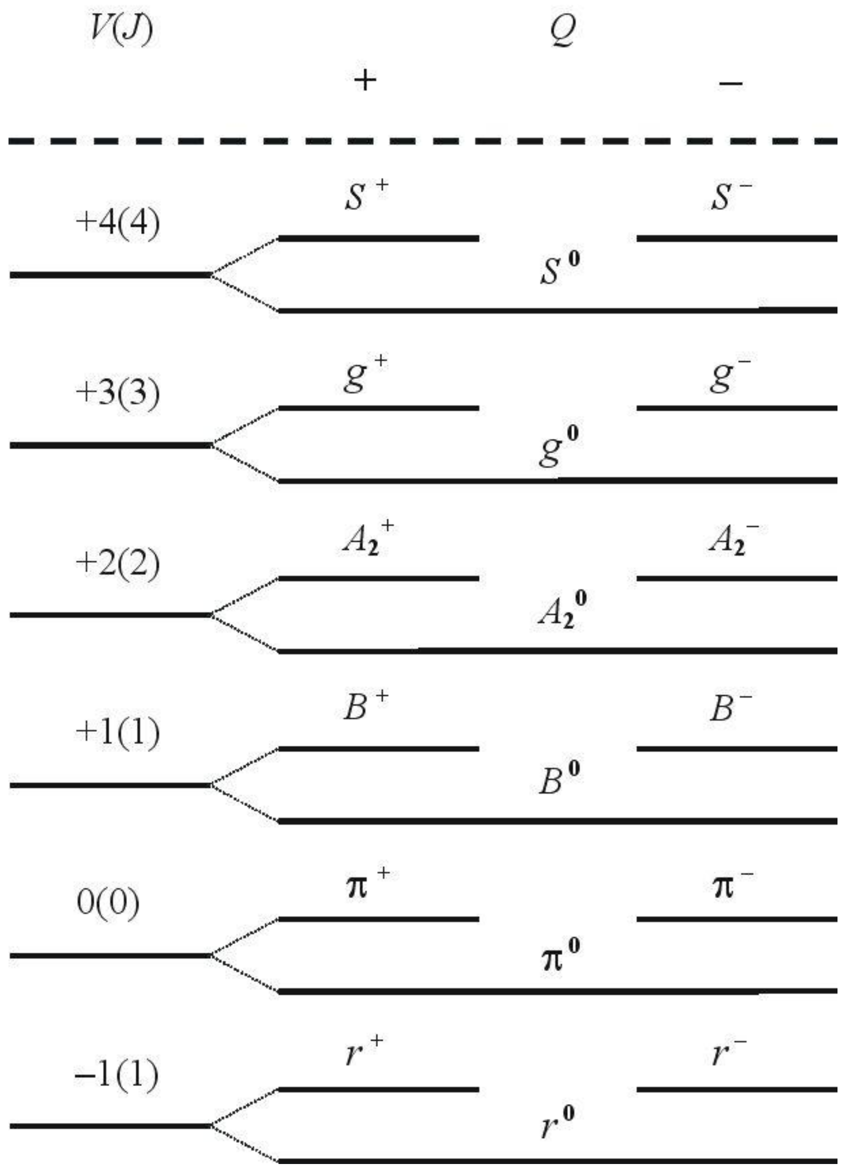

Figure 6 Conditions of a subgroup π - meson.

In figure 7 conditions of a subgroup of a proton (p, $L={}^{3}/_{2}$), are presented. As we see, their structure completely repeats lepton (μ - meson), as should be.

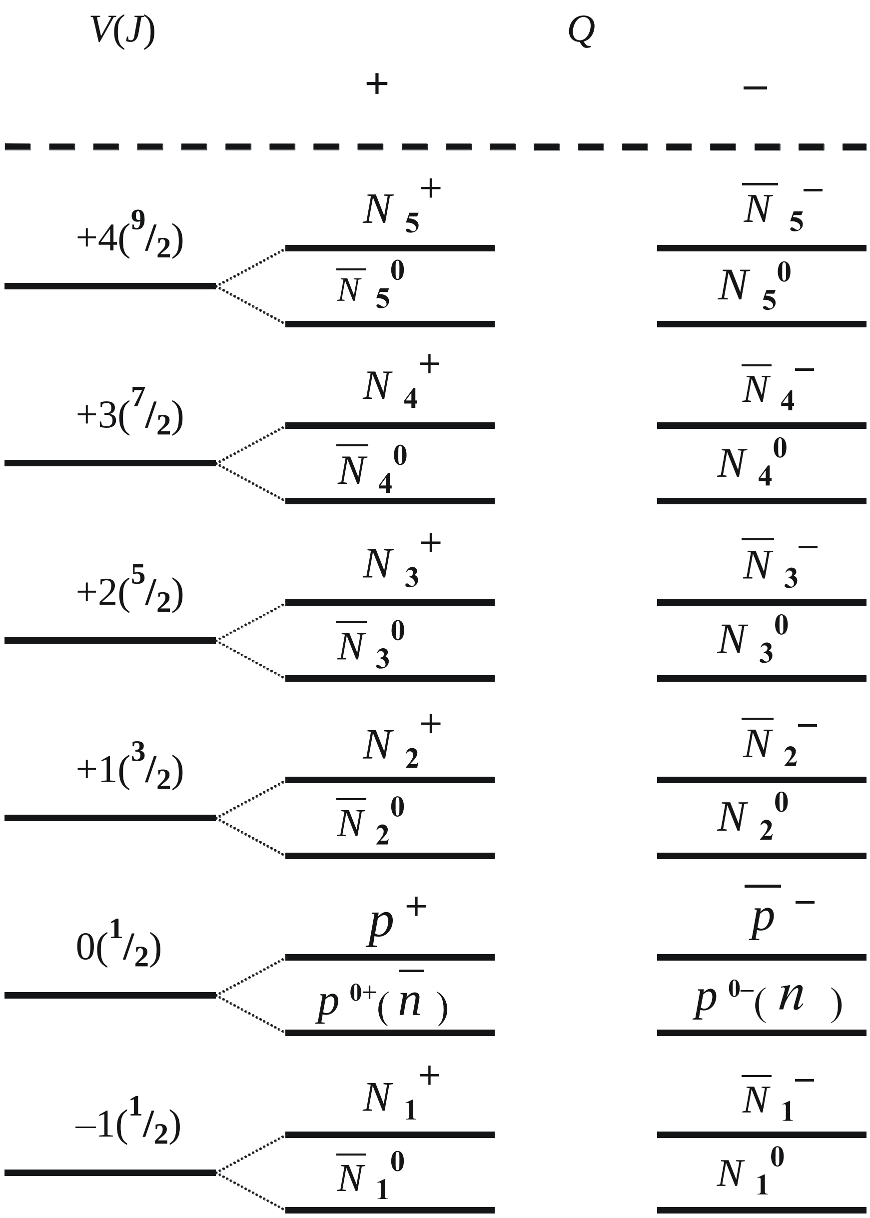

Figure 7 Conditions of a subgroup of a proton (*p*).

In figure 8 conditions of a subgroup vector *D* – meson are presented. They also all are symmetric. That fact looks surprising that energy of the raised condition with *V*= –1 (*J*=0) has appeared below energy of the basic condition (1860 Mev and 2000 Mev accordingly). The elementary particle is not atom; the basic condition not necessarily should possess the minimum energy.

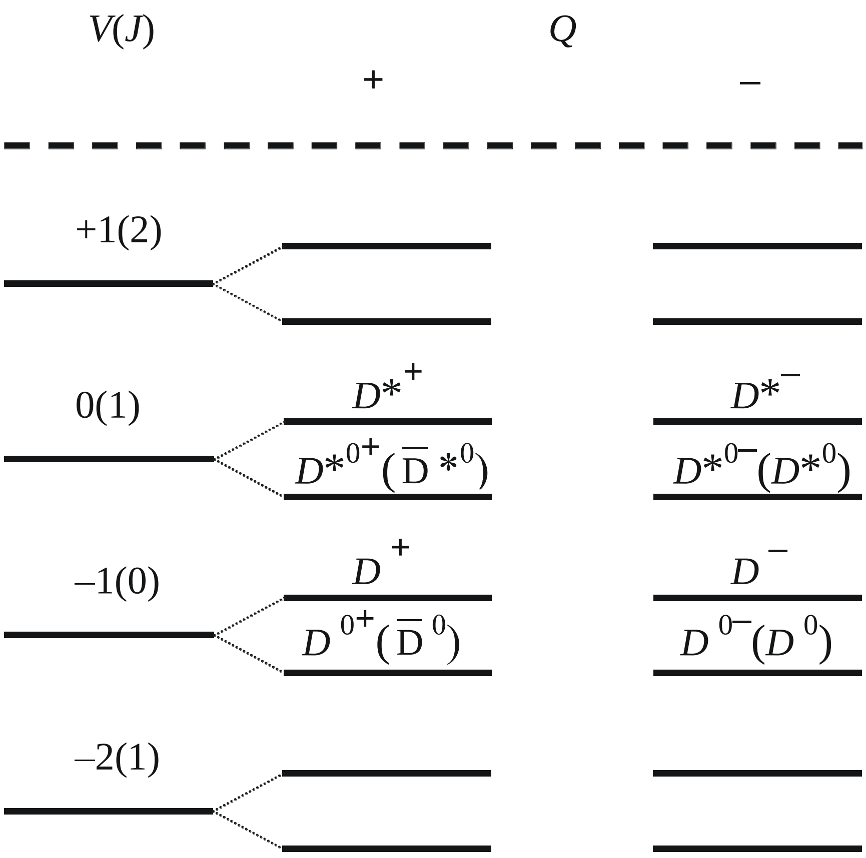

Figure 8 Conditions of a subgroup vector *D** - meson.

And in summary, I will tell about particles with a double electric charge. They really have difficult structure, but consist of two real-life elementary particles.

And at last, we will look at a fragment of the total table of conditions of elementary particles (figure 9). Infinite number of elementary particles everyone from which can have infinite number of the raised conditions – these are microcosm realities. In process of opening of new particles and their raised conditions the table all time will replenish.

$L(J)$	M_L		$Q(V=0)$		$Q(V)$		$Q(V)$		$Q(V)$		$Q(V)$	
			+	−	+	−	+	−	+	−	+	−
0 (1)	γ		γ		$V(J)=+1(^1/_2)$		$V(J)=+2(^3/_2)$		$V(J)=+3(^5/_2)$		$V(J)=+4(^7/_2)$	
$^1/_2(^1/_2)$	e	1	e^+	e^-	+	-	+	-	+	-	+	-
		0	$e^{0+}(\bar{\nu}_e)$	$e^{0-}(\nu_e)$	0+	0−	0+	0−	0+	0−	0+	0−
	μ	1	μ^+	μ^-	τ^+	τ^-	+	-	+	-	+	-
		0	$\mu^{0+}(\bar{\nu}_\mu)$	$\mu^{0-}(\nu_\mu)$	$\tau^{0+}(\bar{\nu}_\tau)$	$\tau^{0-}(\nu_\tau)$	0+	0−	0+	0−	0+	0−
					$V(J)=-1(1)$		$V(J)=+1(1)$		$V(J)=+2(2)$		$V(J)=+3(3)$	
1 (0)	π	1	π^+	π^-	r^+	r^-	B^+	B^-	A_2^+	A_2^-	g^+	g^-
		0	π^0		r^0		B^0		A_2^0		g^0	
	K	1	K^+	K^-	K^{*+}	K^{*-}	K^{*+}_D	K^{*-}_D	$K^*{}_1^+$	$K^*{}_1^-$	+	-
		0	K^0		K^{*0}		K^{*0}_D		$K^*{}_1^0$		0	
	η	1	η^+	η^-	+	-	+	-	+	-	+	-
		0	η^0		0		0		0		0	
					$V(J)=-1(^1/_2)$		$V(J)=+1(^3/_2)$		$V(J)=+2(^5/_2)$		$V(J)=+3(^7/_2)$	
$^3/_2(^1/_2)$	p	1	p^+	p^-	N_1^+	$\bar{N}_1^-$	N_2^+	$\bar{N}_2^-$	N_3^+	$\bar{N}_3^-$	N_4^+	$\bar{N}_4^-$
		0	$p^{0+}(\bar{n})$	$p^{0-}(n)$	$\bar{N}_1^{0+}$	N_1^{0-}	$\bar{N}_2^{0+}$	N_2^{0-}	$\bar{N}_3^{0+}$	N_3^{0-}	$\bar{N}_4^{0+}$	N_4^{0-}
	Λ	1	$\Lambda^+(\Sigma^+)$	$\Lambda^-(\bar{\Sigma}^+)$	Δ_2^+	Δ_2^-	Δ_1^+	Δ_1^-	Δ_3^+	Δ_3^-	Δ_4^+	Δ_4^-
		0	$\Lambda^{0+}(\bar{\Lambda}^0)$	Λ^0	Δ_2^{0+}	Δ_2^{0-}	Δ_1^{0+}	Δ_1^{0-}	Δ_3^{0+}	Δ_3^{0-}	Δ_4^{0+}	Δ_4^{0-}
	Σ	1	$\Sigma^+(\bar{\Sigma}^-)$	Σ^-	+	-	Σ_1^+	Σ_1^-	Σ_2^+	Σ_2^-	Σ_3^+	Σ_3^-
		0	$\Sigma^{0+}(\Sigma^0)^*$	$\Sigma^{0-}(\bar{\Sigma}^0)^*$	0+	0−	Σ_1^{0+}	Σ_1^{0-}	Σ_2^{0+}	Σ_2^{0-}	Σ_3^{0+}	Σ_3^{0-}
	Ξ	1	$\Xi^+(\bar{\Xi}^-)$	Ξ^-	+	-	Ω^+	Ω^-	+	-	+	-
		0	$\Xi^{0+}(\Xi^0)^*$	$\Xi^{0-}(\bar{\Xi}^0)^*$	0+	0−	Ω^{0+}	Ω^{0-}	0+	0−	0+	0−
					$V(J)=-2(1)$		$V(J)=-1(0)$		$V(J)=+1(2)$		$V(J)=+2(3)$	
2 (1)	D^*	1	D^{*+}	D^{*-}	+	-	D^+	D^-	+	-	+	-
		0	$D^{*0+}(\bar{D}^{*0})$	$D^{*0-}(D^{*0})$	0+	0−	$D^{0+}(\bar{D}^0)$	$D^{0-}(D^0)$	0+	0−	0+	0−
		1	+	-	+	-	+	-	+	-	+	-
		0	0+	0−	0+	0−	0+	0−	0+	0−	0+	0−
		1	+	-	+	-	+	-	+	-	+	-
		0	0+	0−	0+	0−	0+	0−	0+	0−	0+	0−
		1	+	-	+	-	+	-	+	-	+	-
		0	0+	0−	0+	0−	0+	0−	0+	0−	0+	0−
		1	+	+	+	-	+	-	+	-	+	-
		0	0+	0−	0+	0−	0+	0−	0+	0−	0+	0−

Figure 9 Fragment of a spectrum of conditions of elementary particles

It would be possible, reasonable to designate all raised conditions a symbol of a subgroup with instructions of quantum numbers V and Q. So, for example, Δ_2^+ it is possible to designate as Λ^{+}_{-1}, and $\tau^{0+}(\bar{\nu}_\tau)$ as μ^{0+}_{+1} (the top index – quantum number Q, and the bottom index – quantum number V).. Introduction of similar designations of conditions of elementary particles will be more logical and will reduce number of used symbols.

4. CONCLUSIONS

The received spectrum covering all elementary particles, and also correct values of quantum numbers and many other things speak about fidelity of postulates of section 2. But on it their consequences don't come to an end.

Vladimir Gorunovich
03/2008

Changes 7/20/2011

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