THEORY OF ELECTRON

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Abstract. The solution with no singularity of wave equation for E-M fields is solved not to Bessel function, which's geometrical size is little enough to explain all effects in matter's structure: strong, weak effect or even other new ones. The mathematic calculation leaded by quantum theory reveals the quantization of charge for electron at first, then the reason and calculation of weak or strong decay and static properties of elementary particles, all coincide with experimental data, and a covariant equation comprising bent space is proposed to explain mass.

Contents

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1. Unit Dimension of *sch*

A rebuilding of units and physical dimensions is needed. Time s is fundamental. The velocity of light is set to 1

$$Velocity: c = 1$$

Hence the dimension of length is

$$L : c(s)$$

The $\hbar$ is set to 1

$$Energy: \hbar(s^{-1})$$

In Maxwell equations the following is set

$$c\epsilon = 1, c\mu = 1$$

One can have

$$\epsilon : \frac{Q^2}{\varepsilon L};$$

$$\mu : \frac{\varepsilon L}{c^2 Q^2}$$

$$UnitiveElectricalCharge: \sigma = \sqrt{\hbar}$$

It's very strange that the charge is analyzed as space and mass. Charge Q is then defined as Q/σ here, without unit.

$$\sigma = 1.03 \times 10^{-17} C = 64e, e_{/\sigma} = e/\sigma = 1/64 = 1.56 \times 10^{-2}$$

$$H : Q/(LT) : \sqrt{\hbar}/c(s^{-2})$$

$$E : \varepsilon/(LQ) : \sqrt{\hbar}/c(s^{-2})$$

If $\hbar, c$ is taken as a number instead of unit, then all physical units is described as the powers of the second: s^n.

The unit of charge can be reset by *linear variation of charge-unit*

$$Q \to CQ, Q : \sigma/C$$

We will use it without detailed explanation.

2. Quantization

All above discussion bases on a explanation of quantization, or *real* probability explanation for quantum theory, which bases on a Transfer Probability Matrix (TPM)

$$P_i(x)M = P_f(x)$$

As a fact, that a particle appears in a point at rate 1 is independent with appearing at anther point at rate 1. There still another pairs of independent states

$$S_1 = e^{ipx}, S_2 = e^{ip'x}$$

because

$$< s_1, s_2 >= \int dV s_1 s_2^* = N\delta(p - p')$$

In fact in the TPM formulation, it's been accepted for granted that the Hermitian inner-product is the measure of the dependence of two states, and it is also implied by the formula

$$P_1 M P_2^*$$

Depending on this view point one can constructs a wave

$$e^{ipx}$$

and gifts it with the momentum explanation p, Then all quantum theory is set up.

3. Self-consistent Electrical-magnetic Fields

The Maxwell equations are

$$\frac{\partial H}{\partial t} + \nabla \times E = 0$$

$$\frac{\partial E}{\partial t} - \nabla \times H + J = 0$$

Symbols are defined

$$U^{ij} := F^{ij}, i, j \neq 0, U_{0i} = U^*_{i0} = iF_{0i}$$

$$2\epsilon := U^* \bullet U := \sum_{i,j} U^*_{ij} \bullet U_{ij}$$

it's discussed that plat and straight space and all physicals in time-dimension is applied a factor i. '$\bullet$' is similar to '$\cdot$' and we will extends its meaning latter.

$$U_{ij,j} = J$$

Firstly, Φ is unidentified matter that's in fact property of space.

Secondly writing down a equation conforming to the logics of physical dimensions,

$$|Q\Phi \cdot \partial_t \Phi^*| = U^* \bullet U/2, < \Phi, \Phi >= 1 \tag{3.1}$$

The energy of system is proportional to system's gross charge and its dimensional factor is 1. This equation explains charge's distribution.

The charge Q is set to 1 by variation of unit.

Because the initial gross momentum distribution is kept in the scene of effects, it's

$$\Phi^* \partial \Phi = \partial (U^* \bullet U)/2 \tag{3.2}$$

So that the current is judged by the momentum. Hence the valid equations is

$$U_{ik,k} = \Delta_t (U^* \bullet (\int^t dt)^2 U)_{,i}/2 \tag{3.3}$$

This equation is local for the left. A possible gauge to meet

$$\mathbf{j} \cdot \mathbf{A} = 0$$

is chosen. This equation is solved to

$$V\rho = 2\epsilon, \rho = -\Delta_t \epsilon^t =: \int dt \Delta_t \epsilon$$

$$\partial \Delta_t \epsilon = \rho \partial V$$

They are deduced from the quantum or Newtonian explanation of E-M fields.

$$(\Delta_t \epsilon)^2 = \Delta_t \epsilon_t \Delta_t \epsilon^t$$

$$\frac{\Delta_t \epsilon}{\Delta_0 \epsilon} = e^{-tV_0/2} \tag{3.4}$$

$$\frac{\int dV \Delta_t \epsilon}{\int dV \Delta_0 \epsilon} = e^{t \int dV \Delta_0^\infty \epsilon} \tag{3.5}$$

The explanation of a wave

$$U := Xe^{ipx}$$

is: Its charge density is $-iU^* \cdot \int^t dtU$ and it's charge-energy product density is $U^* \cdot U$. The equation 3.3 have symmetries

$$CPT, CcT$$

The covariant equation for this Newton-like description is of cause

$$U_{ik,kll} = \Delta_t(U^* \bullet U), i/2$$

As $d\tau \to id\tau$

$$U_{ik,kll} = -\Delta_t(U^* \bullet U), i/2$$

This symmetry operation is the exchange between the two sides of Visual Border, which generates anti-matter.

4. Stable Particle

All particles are elementarily E-M fields is presumed. It's trying to find stable solution of the Maxwell equations *in complex domain*

$$\nabla \times E + \partial_t H = 0$$

$$-\nabla \times H + \partial_t E = -\nabla(\int^t dt)^2 \Delta_t(E \cdot E^* + H \cdot H^*)/2$$

One can write down the solution possible initially and correct it by re-substitution latter

$$E = E_0 + iE_t e^{ikt}, H = H_0 + H_t e^{ikt}$$

In the first round of substitution

$$kH_t + \nabla \times E_t = 0$$

$$J_t = -\nabla(E_0^* \cdot iE_t e^{ikt} + H_0^* \cdot H_t e^{ikt}))/(2k^2) + cc.$$

$$kE_t e^{ikt} + \nabla \times H_t e^{ikt} = J_t$$

$$S = [E, H]^* \cdot [E, H]^T$$

$$\nabla \times H_0 = [E, H]^* \frac{-i\partial_t}{2k^3} \nabla [E, H]^T = J_0$$

$$\nabla \cdot E_0 = [E, H]^* \frac{-i\partial_t}{2k^2} [E, H]^T = \rho_0 \tag{4.1}$$

$$\nabla \times E_0 = 0$$

$$\int dV \cdot S = 2kQ$$

By re-substitution the solution is found like

$$\Delta_{n+1} E_0(\mathbf{r}) = \int dV' \cdot \frac{(\mathbf{r} - \mathbf{r'}) \cdot \Delta_n \rho_0(\mathbf{r'})}{4\pi(r - r')^3}$$

$$\Delta_{n+1} H_0(\mathbf{r}) = \int dV' \cdot \frac{(\mathbf{r} - \mathbf{r'}) \times \Delta_n J_0(\mathbf{r'})}{4\pi(r - r')^3}$$

$$\Delta_{n+1}(\partial_t E) = \Delta_{n+1} J_t$$

$$S_{n+1} \to \alpha S_{n+1} : \int dV \cdot \rho_0 = Q$$

The last one is normalization by charge and natural frequency.

As above It's to choose the initiation of the re-substitution that this state

$$\nabla^2(E_r, H_r) = -k^2(E_r, H_r)$$

This state of E-field is called the *core* of the particle. The final solution has branch of higher frequency nk. The wave function Ψ is

$$\Psi = [E, H], \Psi^+ = [E, H]^{*T}$$

The static features are the following:
The static M-field by momentum

$$\hat{H}_0 = \frac{-i\partial_t \hat{\mathbf{p}}}{k^3}$$

The magnetic dipole moment operator by angular momentum

$$\hat{\mu_z} = \frac{-i\partial_t \partial_\phi}{k^3}$$

Both are in unitized charge. The $< \Psi, \Psi >$ is normalized to $2kQ$ and for any physical s

$$s =< \Psi|\hat{s}|\Psi >$$

5. Radium Function

Firstly

$$\nabla^2 H = -k^2 H$$

is solved. Exactly, it's solved in spherical coordinate

$$0 = r^2\nabla^2 f + k^2 f = (r^2 f_r)_r + k^2 r^2 f + \frac{1}{\sin\theta}(\sin\theta f_\theta)_\theta + \frac{1}{\sin^2\theta}(f_\phi)_\phi$$

Its solution is

$$f = R\Theta\Phi = R_l Y_{lm}$$
$$\Theta = P_l^m(\cos\theta), \Phi = \cos(\alpha + m\phi)$$
$$R_l = N\eta_l(kr), \eta_l(r) = r^l \int_0^\infty \frac{(1-\lambda)^l}{(1+\lambda)^{l+2}} \cos(\lambda r) d\lambda$$
$$\int_0^\infty dr \cdot r^2 R^2 = 1$$

R is solved like

$$(r^2 R_r)_r = -k^2 r^2 R + l(l+1)R, l \geq 0$$
$$R \to rR'$$
$$(r^2 R')_{rr} = -k^2 r^2 R' + l(l+1)R'$$
$$R' \to r^{l-1} R'$$
$$rR'_r r + 2(l+1)R'_r + k^2 r R' = 0$$
$$r \to r/k$$
$$(s^2 F)' + 2(l+1)F + F' = 0, F = F(R')$$

$F()$ is the Fourier transform

$$R' = \int_0^\infty \frac{(1-\lambda)^l}{(1+\lambda)^{l+2}} \cos(\lambda r) d\lambda$$

The function R' has zero derivative at $r = 0$ and is zero as $r \to \infty$. Obviously there is no quantization for it.

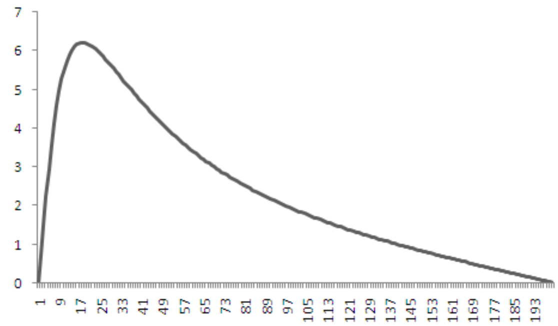

FIGURE 1. the shape of radium function R_1 by DFT

6. SOLUTION

The derivatives of the function of electron has a strange breaking point in coordinate origin hence without normal convenience of Fourier transform. The following are some proximation of the first rank. The solution of $l = 1, m = 1, Q = e_{/\sigma}$ is calculated or tested. The initial state for re-substitution is

$$E_t = \hat{z}k^2 R_1(kr)Y_{1,1}, Q = 1$$

The curve of R_1 is like the one in the figure 1.

It tries to find the quantum Q of the particle

$$\nabla\nabla \cdot iE_t e^{ikt} = -J_t$$

The imaginary part and the higher power of Q is omitted in integration

$$\int dV \cdot (\Re(E_t) \cdot \nabla)\nabla \cdot \Re(E_t) = \int dV \cdot 2(\Re(E_t))^4/k^2$$

As the result the quantization of natural charge is obtained,

$$Q = 0.0140\sigma$$

It's close to the charge of *electron*

$$e_{/\sigma} = 0.0156017[1]$$

The calculation of electric dipole moment of first rank of proximation leads to a zero results. I guess it's zero to any rank of proximation.

The magnetic dipole moment μ_z is calculated as the first rank of proximation

$$\begin{aligned}\mu_z &= \frac{1}{2k^2}\int dV \cdot (E \cdot \partial_\phi E^* + H \cdot \partial_\phi H^*) \\ &= \frac{1}{2k^2}\int dV \cdot (E_t \cdot E_t^* + H_t \cdot H_t^*) \\ &= \frac{Q}{2k} = \mu_B\end{aligned}$$

if $Q = e_{/\sigma}$.

7. Charge, the Relation between Mass and Energy

From the discussion above, the quantum of charge is an inferior physical. The dimensions of physic system are two: time and mass, which's in units system: Kg and s, in constants: m_e, e. In *sch* dependence: $s, \hbar$. But they are connected each other. From the equation 3.1

$$\int dV \cdot |U|^2/2 = Qk$$

The natural frequency marks static mass—this result is one of relative theory and very natural. This formula also evinces that the energy of E-M fields is not all the energy of this particle but a part Q of the whole. In fact the relative-charge distributes the energy between mass (ie. space) and E-M fields. The notion Q is fit to be interpreted as "quotient". The following will discuss this in details.

As two electrons meet and effect each other, their phases of the vibrations are also key, but the effect of phase is not observed. Considering two electrons with the same phase start from the same place and meet at the other one, the relative theory give a result that their phase are the same as they meet.If one defines unitary and orthogonal frame field P_i

$$DP_i = 0, P_i(O) \cdot P_j(O) = 0, |P_i| = 1$$

And the frame

$$g^i_{,i} dx_i = P_i$$

and the free and orthogonal harmonic waves

$$e^{i \sum_i p_i g^i}$$

In fact *under this base* P_i *all differential is good as covariant and can be operated like in straight and flat space*. More over we have the covariant spectrum indexed by p.

One can guess that all the electrons in this cosmos are generated in the same place and the same time.

If the equation that connects space and E-M fields is written down for cosmos of electrons, it's proximately the following:

$$R_{ij} - \frac{1}{2} R g_{ij} = 8\pi G \Delta_t T_{ij}/e^2_{/\sigma} \tag{7.1}$$

$$T_{ij} = F^{\mu}_{i} \bullet F^{*}_{\mu j} - \frac{1}{4} F_{\mu\nu} \bullet F^{\mu\nu *}$$

All tensors are expressed in base P_i. This equation is of no importance but of giving mass because the space is decided by E-M fields instantly. This formula is suitable for composite particle (for electron only a $1/e_{/\sigma}$ is applied in the factor), The detailed reason is in the section 9

The Einstein's Theory of space and gravity is compatible with this theory and explains the energy of space and the looking mass k (generated by moving coordinate system) of particle.

8. Electrons and Their Symmetries

Some states of electrical field are defined as the core (branch of U) of the electron

$$e_r^+ : R_1 Y_{1,1} e^{-ikt}\hat{z},$$
$$e_l^+ = R_{-z}(e_r^+) : R_1 Y_{1,-1} e^{-ikt}\hat{z}$$
$$e_r^- = R_{-z}(e_l^-) : -R_1 Y_{1,-1} e^{ikt}\hat{z}$$
$$e_l^- : -R_1 Y_{1,1} e^{ikt}\hat{z}, (CPT)$$
$$R_{-z} : Rotation : z \to -z, x \to -x, y \to y$$

We use these symbols e-s to express the fields (E, M). Equivalently we can construct real value electron for a solution. The following is their property relative to symmetries

electons		*CPT*	R_{-z}	*physical*
E_0	$+$	$-$	$+$	$\nabla \cdot E_0 = \rho$
H_0	$+$	$+$	$-$	$\nabla \times H_0 = J_0$
MDM	$+$	$+$	$-$	QS
$Spin$	$+$	$-$	$-$	$\lvert k \rvert \mathbf{r} \times \mathbf{v}$

H_0 is mainly generated by Magnetic Dipole Moment (MDM). Some relative energies of electron are

1)Energy of static E-field crossing

$$\varepsilon_e = k_e \int dV DV' \rho(\mathbf{r})\rho(\mathbf{r}')/|4\pi(\mathbf{r}-\mathbf{r}')|$$
$$\dot{=} \; e_{/\sigma} k_e \int dV \rho(\mathbf{r})/r = \frac{1}{4.876 \times 10^{-16} s}$$

2)Energy of the static M-field crossing

$$\varepsilon_m = \varepsilon_e$$

The value of a crossing term generated by static fields between electrons are

$n(\cdot 2\varepsilon_e)$	e_r^+	e_r^-	e_l^+	e_l^-
e_r^+	$+$	$-$	0	0
e_r^-	$-$	$+$	0	0
e_l^+	0	0	$+$	$-$
e_l^-	0	0	$-$	$+$

As two electrons fold their crossing term generated by dynamic correction (of electron function) is calculated like

$$\Delta E = \nabla(H_0 \cdot H + E_0 \cdot E + cc.)/2$$

One can find one crossing correction is

$$\varepsilon_x \dot{=} \; e_{/\sigma} \int dV 2\Re(E_t)^4 = \frac{1}{4.50 \times 10^{-8} s}$$

The value of a crossing term generated by this correction between electrons are

$n(\cdot 2\varepsilon_x)$	e_r^+	e_r^-	e_l^+	e_l^-
e_r^+	$-$	0	0	$-$
e_r^-	0	$-$	$-$	0
e_l^+	0	$-$	$-$	0
e_l^-	$-$	0	0	$-$

9. Physics for the Cosmos of Electrons

In the group of electrons the fields is expressed by probabilities

$$U \to U = \sum_i P_i e_i$$

by consideration of distribution of probability for each electrons. The wave function of fields is

$$\phi_i = \sum_y f_i(y) e_i(x-y), \phi = \sum_i \phi_i$$

It's obviously that the $f_i f_i^* = P_i$ is normalized (integrated) to 1. By probability analysis the energy of the fields is (see the reasoning in the section of conclusion)

(9.1)

$$\phi \bullet \phi^*/2 := \sum_{i,j} \sum_{y,y'} f_i(y) e_i(x-y) f_j^*(y') e_j^*(x-y')/2 + \sum_{i,j} \sum_y f_i(y) e_i(x-y) f_j(y)^* e_j^*(x-y)/2$$

$$=: \epsilon_w + \epsilon_s =: \epsilon$$

The two parts are *strong interaction or coupling* ϵ_s and the *weak interaction* ϵ_w

This fields has some different from the prime and classical fields, something dependent on probabilities. the term $f_i * q_i \cdot (f_i * q_i)^*$ (convolution in space) is to express the weak interaction energy. The equation of 7.1 and 3.3 must be revised according to this then "$\bullet$" has a new meaning. After that on 3.3, the outer wave function f_i has dimension of charge density and it's normalized to a quantum 1, then for the equation the dimension of charge has two degree difference between the two sides. This means the equation 7.1 must be applied factor $1/e_\sigma^2$.

The static central charge of system is

$$\rho_s = \sum_i (f_i^* f_i) * \rho_{e_i} \tag{9.2}$$

The static MDM of system of electrons is proximately

$$\frac{1}{2k} \sum_i \frac{Q_i}{|Q_i|} (f_i^* \partial_\phi f_i * e_i e_i^* + f_i^* f_i * e_i^* \partial_\phi e_i)$$

This result is analyzed in spectrum and comes from the static fields.

10. Propagation and Movement

Electrons system has propagation like

$$\sum_i e_{Xr,l,z} * e_i, \sum_i f_i * e_i$$

$$e_{Xr,l,z} := N \cdot CoreOf(e^+_{r,l,z}(k_X)) \cdot \hat{z}$$

$$e_{Xx} = (e_{Xl} + e_{Xr})/\sqrt{2}$$

For example, the following are all (stable) classical propagations

particle	*electron*	*neutino*	*photon*
notation	e_r^+	ν_r	γ_r
structure	e_r^+	$(e_r^+ + e_l^-)$	$(e_r^+ + e_r^-)$

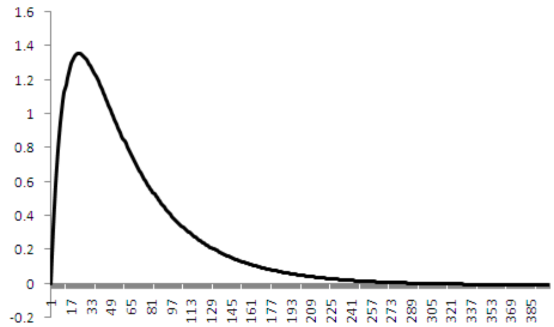

FIGURE 2. the shape of distribution of momenta in one direction, calculated through spherical Bessel functions

If the self angular function of an electron in propagation (first level wave) is orthogonal then this term is zero and is called close (electron), otherwise it's called open. The crossing part of these wave

$$\int dV(e_{ax_i} * e^+_{x_j}) \cdot (e_{ax_k} * e^+_{x_l})^* = 0$$

if not $i = j = k = l$.

The function

$$\varsigma_{k,l,m}(x) := R_l(kr)Y_{l,m}e^{-ik't}$$

meets

$$\int dV \varsigma_{k,l,m}(x)\varsigma^*_{k',l',m'}(x) = 0, k \neq k' \vee l \neq l \vee m \neq m'$$

The function $\varsigma_{k,l,m}(x)$ has a distributing momentum ie. when $k = k'$ the momentum is not constrained by $p^2 = 0$. The figure 2 is the shape of distribution of the momenta in one direction. The reason is that a singularity is at coordinate original to frustrate the convenience in the Fourier space.

The movement of the (stable) propagation is called *Movement*, ie. the second level wave, for example

$$e^{i\mathbf{pr}-ikt} * \delta(\mathbf{r}) * e^+$$

It's a harmonic function of dimensions of space, as a wave that's explained as mass $|k_e|$ of the particle in the movement described by this second level wave (in fact a probability to describe appearance.) that has movement p . In this angle of view, this wave describes all the property of the fields and divides the fields to (weak) E-M fields and the mechanic field that's generated by mass $|k_e|$ whose property is *Motion*.

11. Polarization of Electron and Compatibles to Perturbation Theory

$$\frac{1}{2\pi} e *_\phi e^{ia\phi} := \frac{1}{2\pi}\int_0^{2\pi} d\phi' e(r,\theta,\phi')e^{ia(\phi-\phi')}$$

It's important to note that the wave $e^{ia\phi}$ and its integral have no unit.

The current calculation about scattering dependent on ”structure function” that initiates from study of e-p scattering, which my prediction the figure 2 seems fit to very well. if the both were understood correctly they will be fit to each others.

12. Antiparticle and Radiation

The radiation of photon is derive from this reaction

$$e^{ip_1x} * e_r^+ + e^{ip_2x} * e_r^- \to e^{ip_3x} * \gamma_r$$

The emission (of E-M fields), that's the reason to react forward but is not the all energy variation related, is

$$4\varepsilon_e = \frac{1}{1.219 \times 10^{-16}s}$$

this energy marks the intension of electromagnet effect.

The wave of photon

$$e^{i\mathbf{pr}+ikt} * (e_r^+ + e_r^-)$$

has a mechanic field that describes a movement of a mass

$$k_e - k_e = 0$$

The equivalent reaction is like

$$e^{ip_1x} * e_r^+ \to e^{-ip_2x} * \overline{e_r^-} + e^{ip_3x} * \gamma_r$$

$\overline{e_l^+}$ is just the equivalent for the equilibrium after the particle e_r^- is shifted to the other side of the reaction. In fact the shift is a transform of conjugation

$$\overline{e_r^-} = (e_r^-)^* \approx -e_r^+$$

The normal matter is called positive matter and this kind above is called antiparticle conventionally. (this term is different from the one derived by CPT)

Antimatter happens by reversing the world's line, with the same map of the event.

The radiation of neutrino depends the reaction

$$e_r^+ + e_l^- \to \nu_r$$

This reaction is with emission of an energy

$$2\varepsilon_x = \frac{1}{2.25 \times 10^{-8}s}$$

this energy marks the intension of weak effect (of this kind). As a testifying one can have

$$4\varepsilon_e : 2\varepsilon_x = 8.46 \times 10^7$$

This is the difference of the intension between electromagnetic effect and weak effect.

13. Conservation Law and Balance Formula

No matter in E-M fields (the elementary) level or in movement (the second) level, the conservation law is *conservation of momentum and conservation of angular momentum.* A *balance formula* for a reaction is the equivalent formula in positive matter, ie. after all anti-matter is shifted to the other side of the reaction formula. Balance formula is suitable for the analysis of the energy transition of E-M fields in the reaction. The *invariance of electron itself* in reaction is also a conservation law according to its balance formula.

14. Muon

In the flowing sections small blocks is analyzed. μ^+ is composed of

$$\mu_l^+ : e_{\mu x} * (-e_r^+ + \nu_l)$$

μ is with mass $3k_e/e_{/\sigma} = 3 \times 64k_e$, spin 1/2, MDM $\mu_B k_e/k_\mu$.

The main channel of decay

$$\mu_l^+ \to e_l^+ - \nu_r + \nu_l$$

is with balance formula

$$e_{\mu x} * \nu_l + e^{-ip_3 x} * \nu_l \to e_{\mu x}^* * e_r^- + e^{ip_1 x} * e_l^+ + e^{ip_2 x} * \nu_l$$

It's only loss of a weak interaction in its weak interaction term:

$$\varepsilon_w = \sum_p \int dV e_{\mu x} * e_l^- \cdot (e^{ipx} * e_l^-)^*$$

The conservation of momentum makes the waves dependent each others but does not disturb the summing up. The scale of propagation and electron function are different greatly to permit a proximation that's calculated by DFT,

$$= \frac{e_{/\sigma} k_e^4 \cdot \beta}{k_\mu^3}$$

$$= \frac{1}{2.166 \times 10^{-6} s} \quad [2.1970 \times 10^{-6} s][1]$$

The data in square bracket is experimental data of the full width.

15. Pion Positive

Pion positive is

$$\pi_r^+ : e_{\pi x} * (2e_r^+ - e_r^-)$$

It's with mass $5 \times 64k_e$, spin 1/2 and MDM $3\mu_B k_e/k_{\pi^+}$.

Decay Channels:

1)

$$\pi^+ \to -\mu_l^+ + \nu_r$$

It's with balance formula

$$e_{\pi x} * 2e_r^+ + e^{-ip_1 x} * e_{\mu x}^* * \nu_r \to e_{\pi x}^* * e_r^+ + e^{ip_2 x} * \nu_r + e^{ip_1 x} * e_{\mu x} * e_r^+$$

The strong interaction between $\delta(r) * e_{\pi x} * 2e_r^+$ and $e^{ip_1 x} * e_{\mu x} * \nu_r$ is zero. The emission of energy is weak interaction in strong interaction term

$$2\varepsilon_x = \frac{1}{2.25 \times 10^{-8} s} \quad [(2.603 \times 10^{-8} s][1]$$

The referenced data is the full width.
2)

$$\pi_r^+ \to -e_l^+ + \nu_r$$

The balance formula is

$$e_{\pi x} * 2e_r^+ + e^{-ip_1x} * e_l^- \to e_{\pi x}^* * e_r^+ + e^{ip_2x} * \nu_r$$

Its emission is quite little and nearly balancing.

16. Pion Neutral

Pion neutral is atom-like particle

$$\pi^0 : f^+ * \nu_r + f^- * \nu_l, < f^+, f^- >= 0$$

It has mass $4k_e$, zero spin and MDM. Its decay modes are
1)

$$\pi^0 \to \gamma_r + \gamma_l$$

The loss of energy is from static field

$$8\varepsilon_e = \frac{1}{6.1 \times 10^{-17}s} \quad [8.4 \times 10^{-17}s][1]$$

2)

$$\pi_0 \to e_r^+ + e_r^- + \gamma_l$$

Its emission is the energy of static field ($4\varepsilon_e$) subtracting of the energy loss by the emission two electrons.

If the π^0 atom absorbs energy it can emit two neutrinos.

17. tau

τ maybe that

$$\tau^+ : 5e_r^+ - 5e_r^- + e_l^+$$

has decay mode

$$\tau^+ \to \mu_l^+ - \nu_l + \nu_r$$

$$e_{\tau x} * 5e_r^+ + e_{\tau x} * e_l^+ + e^{-ip_1x} * e_{\mu x}^* * e_r^- + e^{-ip_2x} * \nu_r \to e_{\tau x}^* * 5e_r^+ + e^{ip_1x} * e_{\mu x} * \nu_l + e^{ip_3x} * \nu_r$$

The loss of energy is the difference of the static fields

$$\int dV dV' \frac{|e_{Xx}|^2 * \rho_e(\mathbf{r}) \cdot |e_{Xx'}|^2 * \rho_e(\mathbf{r'})}{4\pi|\mathbf{r} - \mathbf{r'}|}$$

between τ and μ. In fact $|e_{Xx}|^2$ is close to a function of k_X^3 in a micro difference, hence

$$\Gamma_1 \doteq \frac{4\varepsilon_e}{k_\tau^3/(3k_\mu^3)}$$

$$= \frac{1}{1.95 \times 10^{-13}s} \quad [2.9 \times 10^{-13}s, BR.0.17][1]$$

If we believe the data of decay then the mass of tau should be its half.

From the shape of momentum distribution I can find many experimental data has a shift of initial velocity, I judge many resonance states is evaluated with larger mass than the real.

18. Proton

Proton may be like

$$p^+ : e_{px} * (-4e_r^+ + e_l^- - e_l^+ + 3e_r^-)$$

The mass is $27 \times 64k_e$ that's very close to the real mass. The MDM is calculated as $3\mu_N$, spin is $1/2$. The proton so designed is eternal because even if decay to the fine small the emission is negative. It looks like p-p colliding may have a chance for combining two protons to a stable super-proton.

19. Magic Numbers

We define an unit: Mass-number Unite

$$m := m_e\sigma/e$$

And we presume the Mass-number (in fact being theoretical electron number) in a particle for the four kinds of electrons are

$$e_r^+ : i, e_r^- : j, e_l^+ : k, e_l^- : l$$

The the designation of a particle is an equation

$$\begin{cases} i^2 + j^2 + k^2 + l^2 = M_{/m} \\ i - j + k - l = Q \\ \pm i \pm j \pm k \pm l = 2S \end{cases}$$

The Data of almost all known particles from [1] is not verified because the spin of neutrino is inconsistent with mine and the masses need bing justified again in my opinion.

According to Lagrange's four Square theorem, Any integer can be sum of some four square of integers. But after adding the constraints of charge number or spin number the conditions are not so simple as the Lagrange's theorem.

If consider more complicated design like

$$e_r^+ : i'e_r^+ + \bar{i}\overline{e_r^-}, i' - \bar{i} = i$$

The equations for charge, mass and spin are

$$\begin{cases} (i' - \bar{i})^2 + (j' - \bar{j})^2 + (k' - \bar{k})^2 + (l' - \bar{l})^2 = M_{/m} \\ (i' + \bar{i}) - (j' + \bar{j}) + (k' + \bar{k}) - (l' + \bar{l}) = Q \\ (i' - \bar{i}) + (j' - \bar{j}) - (k' - \bar{k}) - (l' - \bar{l}) = 2S \end{cases}$$

20. Collision and Coupling

For collision the statistical coupling of the two particles depends on the momentum and spin

$$(p, S) = (p_x, p_y, p_z, p_t; S_x, S_y, S_z)$$

The statistical coupling of spins is

$$f_s = \sum_i S_i S_i'$$

The statistical coupling of momentum is

$$f_p = \int dV_4 \cdot xx'$$

For example the head on two flux of electrons, the group statistical coupling of momentum for one flux of particles group is

$$g_p = NN't$$

N is the number of one particles group, t is the dual time. Under the statistics $f_s f_p$, the collision probability of a shape of flux is expressed by rate for a whole coupling.

The scattering is simple from the formula 3.4

$$\mu = (\sum W_f) e^{\int -\hat{V} dt} (\sum W_i^*)$$

This can be expanded to Feymann diagrams.

21. Conclusion

The relative theory is applied to electromagnetic wave to give the looking mass of the fields which stable expresses mass, for example the solved electron function in this article. In my view point the sum-up of the grains of electromagnetic field is a mechanic movement with weaker electromagnetic effect. Fortunately this model will explain all the effects in the known world: strong, weak and electromagnetic effects, and even subclassified them further if not add new ones. In this model the only field is electromagnetic field except space, this is philosophical with the point of that unified world from unique source. The main logics to solve the electron and all depend on a simple fact: the gross momentum in a system is time-invariant, and we can devise the E-M momentum to analysis current.

The energy of matter should happen in this process, the hot matter distilled to protons as got cold with their wave functions dependent each others. the harmony between bent space and electromagnetic fields explain them all.

We have noticed that there is a breaking point in the field of electron that's a polarization, which is mocked by $\delta^{1/2}(x)$ with unit energy. Then the interaction expressed in 9.1 becomes

$$e'(x) \to e(x)(1 + \delta^{1/2}(x))$$

The formal interaction in E-M filed is

$$\Phi_1 = f(y) e'(x - y)$$

and by this we can find

$$\Phi_1 \Phi_1^* = \Phi \bullet \Phi^*$$

The interaction for the strange polarizations has been taken as strong interaction previously.

I found these presumptions on some days of 1994-1995 and soon I find the charge quantization approximately to testify this theory that year. At that time a few people studied in HUST China knew of it. But in the following teen years I nearly forgot of it except now and several years ago a round of submission of it.

References

[1] K. Nakamura et al. (Particle Data Group), JPG 37, 075021 (2010) (URL: http://pdg.lbl.gov)

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