THEORY OF ELECTRON

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ABSTRACT. This article try to unified the four basic forces by Maxwell equations, the only experimental theory. Self-consistent Maxwell equation with the e-current from matter current is proposed, and is solved to four kinds of electrons and the structures of particles. The static properties and decay are reasoned, all meet experimental data. The equation of general relativity sheerly with electromagnetic field is discussed as the base of this theory. In the end the conformation elementarily between this theory and QED and weak theory is discussed.

CONTENTS

1. UNIT DIMENSION OF *sch*

A rebuilding of units and physical dimensions is needed. Time s is fundamental. We can define:
The unit of time: s (second)
The unit of length: cs (c is the velocity of light)

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The unit of energy: $\hbar/s$ (h is Plank constant)

The unit dielectric constant ϵ is

$$[\epsilon] = \frac{[Q]^2}{[E][L]} = \frac{[Q]^2}{\hbar c}$$

The unit of magnetic permeability μ is

$$[\mu] = \frac{[E][T]^2}{[Q]^2[L]} = \frac{\hbar}{c[Q]^2}$$

We can define the unit of Q (charge) as

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

then

$$[Q] = \sqrt{\hbar}$$
$$[H] = [Q]/[L]^2 = [cD] = [E]$$

Then

$$\sqrt{\hbar} : C = (1.0546 \times 10^{-34})^{1/2}$$

C is charge SI unit Coulomb.

For convenience we can define new base units by unit-free constants

$$c = 1, \hbar = 1, [Q] = \sqrt{\hbar}$$

then all physical units are power of second s^n, the units are reduced.

Define

$$UnitiveElectricalCharge : \sigma = \sqrt{\hbar}$$
$$\sigma = 1.03 \times 10^{-17} C \approx 64e$$
$$e_{/\sigma} = e/\sigma = 1.57 \times 10^{-2} \approx 1/64$$

Define and rebuild the system:

$$s \to Cs : 1 = m_e/e_{/\sigma} =: \beta$$

$s \to Cs$ means the value of the redefined second becomes c seconds. We always use this units system.

2. Self-consistent Electrical-magnetic Fields

Try so-called expanded Maxwell equation for the free E-M field in the previously defined units

$$\partial' \cdot \partial A_\nu = iA^{\mu *}\partial_\nu A_\mu/2 + cc. = -J_\nu \tag{2.1}$$
$$\partial_\nu \cdot A^\nu = 0$$

with definition

$$(A^i) := (V, \mathbf{A}), (J^i) = (\rho, \mathbf{J}), (J_i) = (-\rho, \mathbf{J})$$
$$\partial := (\partial_i) := (\partial_t, \partial_{x_1}, \partial_{x_2}, \partial_{x_3})$$
$$\partial' := (\partial^i) := (-\partial_t, \partial_{x_1}, \partial_{x_2}, \partial_{x_3})$$

It's deduced by using momentum to express e-current in a electron: the mass and charge have the same movement in electron. The equation 2.1 have symmetry

$$CPT, cc.PT$$

The energy (reference to the section 15) of the field A under Lorentz gauge are

$$\varepsilon := < \nabla A^\nu, \nabla A_\nu > = < E, E > /2 + < H, H > /2 \tag{2.2}$$

$$\varepsilon|_{\infty}^{t} = - < A^{\nu}, J_{\nu} > |_{\infty}^{t} = < \rho, V > |_{\infty}^{t} \tag{2.3}$$

3. Calculation of Recursive Re-substitution

We can calculates the solution by recursive re-substitution (RRS) for the two sides of the equation. For the equation

$$\hat{P}' B = \hat{P} B$$

make the algorithm (It's approximate, the exact solution needs a rate on the start state in the re-substitution for the normalization condition)

$$\hat{P}'(\sum_{k \le n} B_k + B_{n+1}) = \hat{P} \sum_{k \le n} B_k$$

One can write down a function initially and correct it by re-substitution. Here is the initial state

$$V = V_i e^{-ikt}, A_i = V, \partial_\mu \partial^\mu A_i = 0$$

Substituting into equation 2.1. We call the fields' correction A_n with n degrees of A_i the n degrees correction.

4. Solution

Firstly

$$\nabla^2 A = k^2 A$$

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

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

Its solution is

$$f = R\Theta\Phi = R_l Y_{lm}$$

$$\Theta = P_l^m(\cos\theta), \Phi = \cos(\alpha + m\varphi)$$

$$R_l = N j_l(kr)$$

$j_l(r)$ is spherical Bessel function.

$$j_1(r) = \frac{\sin(r)}{r^2} - \frac{\cos r}{r}$$

$$j_1(0) = 0$$

$$\int_0^\infty dr \cdot r^2 j_1(kr) j_1(k'r) = C k^{-2} \delta(k - k')$$

Define

$$F(x) := N R_1(r) Y_{1,1}(\theta, \varphi)$$

$$F^*(x) * F(x) = \frac{\delta(r)}{4\pi r^2}$$

with consideration

$$\nabla^2 (F^*(x) * F(kx))$$

$\nabla^2 F(kx)$ has a suspending singularity at O. Then

$$F^*(x) * F(x) = \frac{1}{4\pi} \int_I \sin\theta' d\theta' d\varphi' dr' \cdot r' F^*(x') \cdot r' F(x - x')$$

$$\lim_{r' \to 0} r' F^*(x') = 0,$$

$$\lim_{|x - x'| \to 0} r' F(x - x') = 0$$

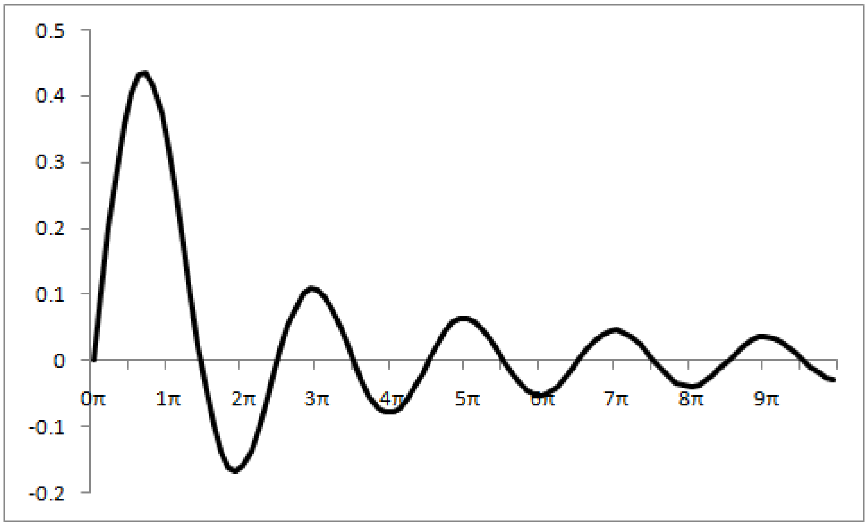

FIGURE 1. The function of j_1

$$\lim_{r'\to\infty} r'F^*(x')\cdot r'F(x-x')$$

$$=C(\theta,\varphi,\theta',\varphi')(\frac{\sin(r')}{r'}-\cos(r'))((1+C')\frac{\sin(r')}{r'}-\cos(r'))+O(r'^{-2})$$

$$k^{3/2}F^*(kx)*k^{3/2}F(kx)=\frac{1}{4\pi}\int_I \sin\theta' d\theta' d\varphi' d(kr')\cdot kr'F^*(kx')\cdot kr'F(kx-kx')$$

$$=\frac{k\delta(kr)}{4\pi k^2 r^2}$$

$\sin(r')/r'$ has fourier transform on variable r'.

Because the function F has not Fourier transform, and $< F, F >$ is infinite, we can consider the limit of its forms truncated.

Define

$$\Omega_k(x) := NR_1(kx)Y, <\Omega_k(x), \Omega_k(x)>=1$$

then

$$<\Omega_1^n(x), \Omega_1^n(x)>=1$$

We have calculation

$$<\nabla\Omega_k*\Omega_1|\nabla\Omega_k*\Omega_1>=<\nabla\Omega_k*\nabla\Omega_k^*|\Omega_1^**\Omega_1>$$

$$=<\nabla\Omega_k*\nabla\Omega_k^*|<\Omega_1|\Omega_1>>=-<(\nabla^2\Omega_k)*\Omega_k^*|<\Omega_1|\Omega_1>>$$

The solution of $l=1, m=1, Q=e_{/\sigma}$ is calculated or tested for electron,

$$V=NR_1(-k_e r)Y_{1,-1}e^{ik_e t}$$

5. Electrons and Their Symmetries

Some states of electrical field A are defined as the core of the electron, which's the start function $A_i = V$ that is electrical, for the RRS to get the whole electron function e:

$$e_r^+ : NR_1(k_e r)Y_{1,1}e^{-ik_e t},$$
$$e_l^+ : NR_1(k_e r)Y_{1,-1}e^{-ik_e t}$$
$$e_r^- : NR_1(-k_e r)Y_{1,-1}e^{ik_e t}$$
$$e_l^- : NR_1(-k_e r)Y_{1,1}e^{ik_e t}$$

Define the symbols:

$$(-e_l^-) := -e_r^+(-t), (-e_l^+) := -e_r^-(-t)$$
$$(-e_r^-) := -e_l^+(-t), (-e_r^+) := -e_l^-(-t)$$

r, l is the direction of the spin.

Normalize the electron function with charge and mass, using the equation 2.1

$$< e_c^\mu | i\partial_t | e_{\mu c} >= Q_c$$
$$< \nabla e_\mu | \nabla e^\mu >= m_e$$

Then

$$k_{ec} = m_e / Q_c$$
$$< e_{c\mu} | e_c^\mu >= Q_c$$

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

$$-\mathbf{r} \times \partial \cdot \partial' A/4 + cc.$$
$$\mu_z =< A_i | - i\partial_\phi | A_i > /4 + cc.$$
$$= \frac{Q_e}{2m_e}$$

By the discussion in the section 2 the spin is

$$S_z = \mu_z k_e / e = 1/2$$

Calculate the correction in RRS of the equation 2.1

$$A_n = A_{n-1} i\partial(A_i - A_i^*)/2 * u \tag{5.1}$$
$$= (A_i^*(i\partial_t A_i)) * u \cdot (i\partial_t(A_i - A_i^*)/2 * u\cdot)^{n-3} i\partial(A_i - A_i^*)/2 * u$$
$$= (A_i^*(i\partial_t A_i))(i\partial_t(A_i - A_i^*)/2)^{n-3}(i\partial(A_i - A_i^*)/2)$$
$$u = \delta(t - r)/(4\pi r)$$

The convolution is made in 4-d space. Generally

$$\partial_x \cdot \partial_x - \partial_t^2 = \partial_{x'} \cdot \partial_{x'}$$
$$(x', t') := (x, t - r), r'^2 = x' \cdot x'$$

and

$$f(x)e^{ict} * u = f(x)e^{ic(t+r)} * \frac{1}{4\pi r} = f(x')e^{ict} * \frac{1}{4\pi r'} = f(x)e^{ict} * \frac{1}{4\pi r}$$
$$\delta(x - 2a) *' f_a(x - a) \cdot g_a(-(x - a)) = \delta(x - 2a) *' g_a(x - a) \cdot f_a(-(x - a))$$

with definition

$$f(x) *' g(x) := \int_{-\infty}^{\infty} f(x + t)g(t)dt$$

hence

$$h(x) *' f(x) \cdot g(-x) = h(x) *' g(x) \cdot f(-x)$$

$$h(x) * f(-x) \cdot g(-x) = h(x) * g(-x) \cdot f(-x) \tag{5.2}$$

Calculate with the properties of RRS start state $A^{\pm}_{rl}$ for $e^{\pm}_{rl}$

$$A^*(k_e, \varphi) = A(-k_e, -\varphi)$$
$$A^-(k_e, \varphi) = A^+(-k_e, \varphi)$$
$$A_l(k_e, \varphi) = A_r(k_e, -\varphi)$$
$$\partial_t A(k_e, \varphi) = -ik_e A(k_e, \varphi)$$

Correct the first degree term of electron function with magnetic part

$$A^\nu = (-\Omega_k(x)e^{-ikt}, i\nabla\Omega_k(x)e^{-ikt}/k)$$

to find

$$< e^\nu|\partial \cdot \partial'|e_\nu >= 0 \tag{5.3}$$
$$\partial_\nu \cdot J_e^\nu = 0$$
$$\partial_\nu \cdot e^\nu = 0$$

These are Lorentz gauge and current constraint.

We have with the discussion of the section 7:

$$< \nabla(e_r^+)^\nu, \nabla(-e_l^+)_\nu >= 0$$
$$< \nabla(e_r^+)^\nu, \nabla(-e_r^-)_\nu >= 0$$
$$< \nabla(e_r^+)^\nu, \nabla(-e_l^-)_\nu >= 0$$

The function of e_r^+ is decoupled with e_l^+

$$2 < \nabla(e_r^+)^\nu, \nabla(e_l^+)_\nu >= 0$$

The increment of field energy ε on the coupling of e_r^+, e_r^- mainly between A_2 is

$$\varepsilon_e = 2 < \nabla(e_r^+)^\nu, \nabla(e_r^-)_\nu >\approx -2e^3_{/\sigma} m_e = -\frac{1}{1.66 \times 10^{-16} s}$$

The condition 2.2 is used. This value of increments on the coupling of electrons are

ε_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	$-$	$+$

The increment of field energy ε on the coupling of e_r^+, e_l^- mainly between A_4 is

$$\varepsilon_x = 2 < \nabla(e_r^+)^\nu, \nabla(e_l^-)_\nu >\approx -\frac{1}{2} e^7_{/\sigma} m_e = -\frac{1}{1.09 \times 10^{-8} s}$$

Other parts are counteracted, including the degree 8. This value of increments on the coupling of electrons are

ε_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	$+$

6. Propagation and Movement

The propagation:

$$f *_3 \sum_i e_i$$

The convolution is on space. The particle number normalization:

$$< f, f >= 1$$

The following are stable propagation:

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

By the condition of 5.3, their static mass except the couplings is zero.

The movement of the propagation is called *Movement*, ie. the third level wave:

$$f * \sum f_i * e_{ij}$$

Calculate the following coupling system of particle x

$$A_x = \sum_i e_i = \sum_c n_c e_c$$

c differ in charge, spin, and being negative or positive:

$$c = (r, l)(+, -)(p, n)$$

The initial and start state for RRS is

$$A_i = e_x *_4 \sum_i e_i$$

$$e_x := \Omega_{k_x} f(t)\delta(t)$$
$$f(t) := e^{-ih(t)}, h \in \mathbf{R}$$

It meets the normalization of particle number. By referencing to the identity 5.2

$$f(t)\delta(t) * g(t) = f(t)g(t) * \delta(t)$$

f is chosen to obtain:

$$\partial \cdot \partial' A_i = 0$$

or equivalently

$$A_i^{\nu *} \cdot (\partial \cdot \partial' A_{i\nu}) = 0$$

We have

$$f(t) \approx e^{-ik_x t}$$

then

$$A_i \approx \Omega_{k_x} e^{-ik_x t} *_3 \sum_i e_i$$

With the normalization of charge

$$< A_i^\nu | i\partial A_{i\nu} >= Q_x$$

then

$$k_x \approx n/Q_x, n := \sum_c n_c^2$$

The initial EM energy is

$$\varepsilon_i =< \nabla A_i^\nu | \nabla A_{i\nu} >\approx n/e_{/\sigma}$$

The initial MDM is

$$\mu_z \approx < A^\nu | - i\partial_\varphi | A_\nu > /4 + cc. \approx \frac{1}{2|k_x|} \sum_c Q_c n_c^2$$

Current is controlled by charge.

The corrected field A meets the equation 2.1 with

$$A = A_i + \sum_{n=2}^{\infty} A_n$$

We notice that the terms in this equation are all delta functions of space, so that the interaction between the decayed blocks are released suddenly all at once, but this decaying process doesn't appear in the solution. Its solution is a solution with electrons and their propagations coupled wholly in grid origin.

Consider the second degree correction of the equation 2.1:

$$\partial' \cdot \partial A_\nu = iA^{\mu *} \partial_\nu A_\mu /2 + cc. = -I_s - I_c$$

For the light decay the self-effect at the initial time

$$-I_{sc} := (e_x * n_c e_c) \cdot \partial (e_x * n_c e_c)$$

$$I_s = \sum_c I_{sc}$$

the crossing effects at the initial time

$$-I_c := cc. + (n_{r+p} n_{r-p} - n_{r+n} n_{r-n})(e_x * e_r^+)^{\mu *} \cdot i\partial (e_x * e_r^-)_\mu$$

$$+ (n_{l+p} n_{l-p} - n_{l+n} n_{l-n})(e_x * e_l^+)^{\mu *} \cdot i\partial (e_x * e_l^-)_\mu$$

$$+ (n_{r+p} n_{l-p} - n_{r+n} n_{l-n})(e_x * e_r^+)^{\mu *} \cdot i\partial (e_x * e_l^-)_\mu$$

$$+ (n_{l+p} n_{r-p} - n_{l+n} n_{r-n})(e_x * e_l^+)^{\mu *} \cdot i\partial (e_x * e_r^-)_\mu$$

We can easily use the coupling of these currents to calculate the emission of a decay mode. The calculation of strong effect is similar.

7. Balance Formula

The reaction

$$A_{1i} - A_{2i} \to A_{1f} - A_{2f}$$

is equivalent of the same energy emission to

$$A_{1i} + A_{2f}(x, -t) \to A_{1f} + A_{2i}(x, -t)$$

by writing them as sums of odd function and even function of t . This means we can shift electron to the other side with the same emission of EM energy for a balance formula.

8. Muon

The core of muon is

$$\mu_r^- : e_\mu * (e_r^- - e_r^+ - e_l^-)$$

From the equation 15.1, μ is approximately with mass $3m_e/e_{/\sigma} = 3 \times 64m_e$ [3.2][1] (The data in bracket is experimental by the referenced lab), spin S_e (electron spin), MDM $\mu_B k_e/k_\mu$.

The main channel of decay

$$\mu_r^- \to e_r^- - \nu_r, \quad e_r^- \to -e_r^- + \nu_l$$

with balance formula

$$e_\mu * e_r^- + \delta^{1/2}(x + v_2 t) * \nu_r$$

$$\to \delta^{1/2}(x - v_1 t) * e_r^- + e_\mu(-t) * \nu_r$$

Reference to the discussion of the section 6 to find the main EM emission is

$$\frac{\varepsilon_x m_e}{k_\mu} = -\frac{1}{2.18 \times 10^{-6}s} \quad [2.1970 \times 10^{-6}s][1]$$

9. Pion

The core of pion is

$$\pi_l^+ : e_\pi(\varphi) * (e_r^+ \pm e_l^+) + e_\pi(-\varphi) * e_l^-$$

It's approximately with mass $3 \times 64m_e$ [4.2][1], spin S_e and MDM $\mu_B k_e/k_{\pi^+}$.

Decay Channels:

$$\pi_l^+ \to e_l^+ + \nu_r, \quad e_l^+ \to -e_l^+ + \nu_l$$

The mean life approximately is

$$-\varepsilon_x/2 = \frac{1}{2.2 \times 10^{-8}s} \quad [(2.603 \times 10^{-8}s][1]$$

The precise result is calculated with successive decays.

10. Pion Neutral

The core of pion neutral is like a atom

$$\pi^0 : ((e_r^+ + e_l^+), (e_r^- + e_l^-))$$

It has mass approximately $4 \times 64m_e$ [4.2][1], zero spin, and zero MDM. Its decay modes are

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

The loss of energy is

$$-2\varepsilon_e = \frac{1}{8.3 \times 10^{-17}s} \quad [8.4 \times 10^{-17}s][1]$$

The following particle is similar to π^0

$$(e_x(-\varphi) * (ne_r^+ - n'e_l^-) + e_x * (e_r^+ + e_l^+),$$

$$e_x(-\varphi) * (-ne_l^- + n'e_r^+) + e_x * (e_r^- + e_l^-))$$

11. Tauon

The core of tauon maybe

$$\tau_r^- : e_\tau(-\varphi) * (ne_r^+ - ne_l^-) + e_\tau * (e_r^- - e_l^- - e_l^+)$$

Its mass approximately $53 \times 64m_e$ [54][1] ($n = 5$), spin S_e and MDM $\mu_B m_e/k_\tau$. It has decay mode with a couple of neutrinos counteracted

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

$$e_\tau * e_r^- + \delta^{1/2}(x + v_2 t) * \gamma_l \to \delta^{1/2}(x - v_1 t) * e_r^- + e_\tau(-t) * \gamma_l$$

The main EM emission is

$$\frac{\varepsilon_e m_e}{k_\tau} = -\frac{1}{5.5 \times 10^{-13}s} \quad [2.91 \times 10^{-13}s; BR. \quad 0.17][1]$$

Perhaps, it's a mixture with distinct coefficients n. The following particle is similar to τ

$$e_\tau(-\varphi) * (-ne_r^+ - e_l^+ - e_l^- + e_r^-) + e_\tau * (ne_l^- - e_r^+ - e_r^- - e_l^+ - e_l^-)$$

12. Proton

The core of proton may be like

$$p_r^- : e_p * (-4e_r^+ - 3e_r^- - 2e_l^-)$$

The mass is $29 \times 64m_e$ [29][1] that's very close to the real mass. The MDM is calculated as $3\mu_N$, spin is S_e. The proton thus designed is eternal.

13. Neutron

Neutron is the atom of a proton and a electron and a neutrino,

$$n = (p_r^+, -\nu_l, e_l^-)$$

Neutrino circles around proton with

$$m_\nu \omega r^2 = 1$$

The interaction is between their (proton and neutrino) magnetic fields of A_2 (gross current)

$$m_\nu \omega^2 r = \frac{1}{4\pi} \cdot 3 \cdot 2 \cdot e_\sigma^2 k_e/(m_p r^2)$$

$$m_\nu = e_{/\sigma}^7 m_e/2$$

The EM energy emitted by neutrino is approximately

$$\frac{1}{2} \cdot (\frac{6}{4\pi})^2 e_{/\sigma}^{7+2\cdot 2} m_e^3/(m_p^2 e_{/\sigma}^2) = \frac{1}{673s}$$

14. Mesons

We can define kinds of energy decreases of decay

interaction	EM	side EM	weak	side weak	strong
abbrevation	L	LS	W	WS	S
emission unit	$-\varepsilon_e$	$-\varepsilon_e m_e/\lvert k_x\rvert$	$-\varepsilon_x$	$-\varepsilon_x m_e/\lvert k_x\rvert$	m_e

We analyze the mesons [1] as the following

name	mass(MeV)	emission	type	ratio	construction
η	547	$1.3keV$	L	–	$\pi^0 - class$, perhaps
$K^{\pm}$	493	$1.24\times 10^{-8}s$	W	0.88	$e_x(\varphi)*(ne_r^+ - e_l^- + e_l^+)$
					$+e_x(-\varphi)*(-ne_l^- + e_r^-)$
K_S^0	–	$10^{-10}s$	–	–	unclear
K_L^0	–	$5\times 10^{-8}s$	–	–	unclear
D^0	1865	$4100\times 10^{-16}s$	LS	1.5	$((-ne_r^+ + n'e_r^- - e_l^+ - e_l^-)$
B^0	5279	$1.52\times 10^{-12}s$	LS	1	$,(ne_l^- - n'e_l^+ - e_r^+ - e_r^-))$
$D_S^{\pm}$	1968	$5000\times 10^{-16}s$	LS	1.3	$\tau - class$
$D^{\pm}$	1869	$10400\times 10^{-16}s$	LS	0.6	τ
$B_S^{\pm}$	5279	$1.6\times 10^{-12}s$	LS	1	$\tau - class$
Υ	9460	$54keV$	–	–	unclear
J/φ	3096	$93keV$	–	–	unclear
others	–	–	S	–	–

15. Mechanical Quantification

The mechanic feature of the electromagnet fields is

$$T_{ij} = F_i^{k*}F_{kj} - g_{ij}F_{\mu\nu}F^{\mu\nu^*}/4$$

T is stress-energy tensor,

$$T_{ij} = \sum mu_iu_j, u = dx/ds$$

T_{00} is quantum expression of the energy, by Lorentz transform it's easy to get the quantum expression of momentum:

$$A^{\nu*}i\partial A_\nu + cc. \propto \sum mu$$

The observed mass in mass-center frame is

$$M = \int dVT_{00}$$

$$M = \varepsilon \tag{15.1}$$

It's obtained by moving the frame and then checking the energy.

The physicals have operators as the following

$< \partial_t A^\nu \vert \partial_t A_\nu >$	mechaincal energy (it's conserved)	E
$< \nabla A^\nu \vert \nabla A_\nu >$	EM energy or analytic kenitic energy	ε
$< \partial A^\nu \vert \partial' A_\nu >$	analytic static mass	m
$< A^\nu \vert J_\nu >$	interaction potential	F, Γ

The decayed part is independent (uncoupled) of the undecayed part for the equation 2.1, hence the undecayed part A' meets the same condition

$$\partial' \cdot \partial A'_\nu = iA'^{\mu*}\partial_\nu A'_\mu/2 + cc.$$

In principle, we can solve this equation to find the decay process. For the partial field A_n of n independent particles decaying to stable state,

$$F =< A_n^\nu|\partial\cdot\partial'|A_{\nu n} >= n\Gamma e^{-C\Gamma t} =< A_n^\mu|iA_n^{\nu *}\partial_\mu A_{\nu n}/2 + cc. >$$

For some number n and charge Q
(15.2)

$$1 = \int_0^\infty dt < A_1^\nu|\partial\cdot\partial'|A_{\nu 1} >= \frac{Q}{\sigma}(\int_0^\infty dt < A_1^\mu|iA_1^{\nu *}\partial_\mu A_{\nu 1}/2 + cc. >), Q = 1$$

$$1 = \int_0^\infty dt < A_n^\nu|\partial\cdot\partial'|A_{\nu n} >= \int_0^\infty dt < A_1^\mu|iA_1^{\nu *}\partial_\mu A_{\nu 1}/2 + cc. >, \sigma = 1$$

then

$$1 = (\int_0^\infty dt < A_n^\nu|\partial\cdot\partial'|A_{\nu n} >)^3 = (\int_0^\infty dt < A_1^\mu|iA_1^{\nu *}\partial_\mu A_{\nu 1}/2 + cc. >)^2$$

$$1 = n^3(\int_0^\infty dt < A_1^\nu|\partial\cdot\partial'|A_{\nu 1} >)^3 = n^2(\int_0^\infty dt < A_1^\mu|iA_1^{\nu *}\partial_\mu A_{\nu 1}/2 + cc. >)^2$$

$$(\int_0^\infty dt < A_1^\nu|\partial\cdot\partial'|A_{\nu 1} >)^3 = (\int_0^\infty dt < A_1^\mu|iA_1^{\nu *}\partial_\mu A_{\nu 1}/2 + cc. >)^2$$

$$\frac{Q}{\sigma} = n^{-1/2}$$

Substitute it into the equation 15.2 to find

$$n = 1$$

hence

$$1 = \int_0^\infty dt < A^\nu|\partial\cdot\partial'|A_\nu > \tag{15.3}$$

It's the normalization of one decaying particle, and it leads to the result between decay life and EM emission (also an interaction potential):

$$C = 1$$

The distribution shape of decay can be explain as

$$e^{-\Gamma t/2}e_x * \sum_i e_i \approx \Omega_x * \sum_i e_i \cdot e^{-\Gamma t/2 - ik_x t}, 0 < t < \Delta$$

is the real wave of the particle x near the initial time. Expand it in that time span

$$\approx \Omega_x * \sum_i e_i \cdot \int_{-\infty}^\infty dk \frac{Ce^{-ikt}}{k - k_x - i\Gamma/2}$$

With calculation, we find the emission of each branch wave is the same.

16. Great Unification

The General Theory of Relativity is

$$R_{ij} - \frac{1}{2}Rg_{ij} = 8\pi G T_{ij}/c^4 \tag{16.1}$$

Firstly we redefine the unit second as S to simplify the equation 16.1

$$R_{ij} - \frac{1}{2}Rg_{ij} = T_{ij}$$

Then

$$R_{ij} - \frac{1}{2}Rg_{ij} = F_i^{k*}F_{kj} - g_{ij}F_{\mu\nu}F^{\mu\nu^*}/4$$

We observe that the co-variant curvature is

$$R_{ij} = F_{ik}^*F_j{}^k + g_{ij}F_{\mu\nu}^*F^{\mu\nu}/8$$

17. Conclusion

Fortunately, this model explained all the effects in the known world: strong, weak and electromagnetic effects, and even subclassify them further if not being to add new ones. In this model the only field is electromagnetic field, and this stands for the philosophical with the point of that unified world is from an unique source, all depend on a simple hypothesis: the current of matter in a system can be devised to analysis the e-charge current.

My description of particles is compatible with QED elementarily, and only contributes to it with theory of consonance state in fact. But my theory isn't compatible to the theory of quarks. In fact, the electron function is a good promotion for the experimental models of proton and electron that went up very early.

Underlining my calculations a fact is that the electron has the same phase (electron resonance), which the BIG BANG theory would explain, all electrons are generated in the same time and place, the same source.

References

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