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Unification and CPH Theory

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Abstract

To date, there is no way to explain the process that describes how particles produce exchange particles in modern physics. According to the results of our year-long research we can definitely say that the best way for unifying the interactions is generalizing color charge from nuclear to photon. Gravitons behave like charge particles and in interactions between gravity and photons, gravitons convert to negative and positive color charges and also magnetic color. These color charges and magnetic color form the electromagnetic energy. Electromagnetic energy converts to matter and anti-matter such as charged particles. Charged particles use gravitons and generate electromagnetic field. This way of looking at the problem show how two opposite charged particles repel each other in far distance and absorb each other at a very small distance. To conclude, this article shows how quarks produce vector bosons.

1 Introduction;

Thus far, physicists have been able to mergeelectromagnetic and the weak nuclear force into the electroweak force, and work is being done to merge electroweak and quantum chromodynamics into a QCD-electroweak interaction. Beyond grand unification, there is also speculation that it may be possible to merge gravity with the other three gauge symmetries into a grand unified theory. But there is no way to explain how particles produce exchange particles in modern physics.

According to the results of our year-long research we can definitely say that the best way for unifying the interactions is generalizeing color charge from nuclear to photon. This new view on color charge means that we can redifine graviton and electromagnetic energy. Gravitons behave like charge particles and in the interaction between gravity and photon, gravitons convert to negative and positive color charges and magnetic color too. These color charges and magnetic color form the electromagnetic energy. Electromagnetic energy converts to matter and anti-matter such as charged particles. Charged particles use gravitons and generate electromagnetic field by. In fact a charged particle is a generator to producing virtual photons, that they are negative and positive photons. This looking shows how two opposite charged particles repel each other in far distance and absorb each other at a very small distance. And in the end, this article shows how quarks produce vector bosons.

In generally, since it appears that all known interactions between objects can be described with only negative and positive color charges.

2 Exchange particles

All four of the fundamental forces involve the exchange of one or more particles. Even the underlying color force, which was presumed to hold the quarks together to make up the range of observed particles, involves an exchange of particles labeled gluons (table1). Such exchange forces may be either attractive or repulsive, but are limited in range by the nature of the exchange force. The maximum range of an exchange force were dictated by the uncertainty principle since the particles involved are created and exist only in the exchange process - they are called "virtual" particles. Such exchange forces are often picture with Feynman diagrams.

Table1; exchange particles

Name	Charge	Spin	Mass (GeV)	Force mediated
Photon	0	1	0	Electromagnetism
$W^{\pm}$	±1	1	80.4	Weak nuclear
Z°	0	1	91.2	Weak nuclear
Gluon	0	1	0	Strong nuclear
Higgs	0	0	>112	Particle acquire mass by Higgs
Graviton	0	2	0	Gravity

The graviton is the exchange particle for the gravity force. The graviton has not been observed yet. The Higgs boson is a hypothesized particle, which, if it exists, would give the mechanism by which particles acquire mass.

2 Mystery of rest mass

In modern physics the relationship between energy and momentum for massless particles given by:

$$\langle E \rangle = \langle |P| \rangle \, c \qquad (1)$$

Now, let’s change our definition about the rest mass of particles. As we know, some particle such as photon’s are never at rest condition in all reference frame’s. They have mass that comes from their energy. For examle a photon has a mass as follows:

$$E = mc^2 = h\nu \;\;\Rightarrow\;\; m = \frac{h\nu}{c^2} \qquad (2)$$

So, there are two kinds particles in physics;

- Some particles like photon’s move with the speed of light (c), in all inertial reference frame, only. We call these kind the N. R. or Never at Rest condition Particles.
- Other particles like electron move with speed v that always v<c in all irertial reference frames.

According to the above definition, photon’s and graviton’s are NR particles, while the electron and proton are particles.

3 Definition of color charges and magnetic color

Many physicists believe the graviton does not exist, at least in the simplistic manner in which it envisioned. Superficially speaking, quantum gravity using the gauge interaction of a spin-2 field (graviton) fails to work like the photon and other gauge bosons do.

Maxwell's equations always admit a spin-1, linear wave, but Einstein's equations rarely admit a spin-2, linear wave, and when they do it is not exact.

However, in this article, the photon is made of gravitons. Suppose a photon with NR mass m and energy $E = h\nu$ at high h falls toward the earth relative to an inertial reference frame on the surface of earth. Its frequency increases of ν to ν'. Suppose a lot gravitons enter into structure of a photon that $\Delta\nu=\nu'-\nu$. The problem is how many gravitons enter into a photon to change the minimum photon energy (minimum of $\Delta\nu$)? Put another way, what is the minimum photon energy?

Therefore, to calculate the number of gravitons of $\Delta\nu$ and explain their properties, suppose a photon with frequency ν is formed of n_1 elements and with frequency ν' contains n_2 elements. These elements are not the same, because they behave with different properties. Let's propose a 4×1 matrix as following;

$$\begin{bmatrix} A \\ B \\ C \\ D \end{bmatrix}$$

Now, we should calculate A, B, C and D to satisfy the properties of a photon. When gravity works on a photon, gravitons enter into the photon and the intensity of the electric field increases. The photon has no electrical effect; therefore A and B must carry electric effect around the photon with opposite effect. So, assuming the relationship between the intensity of electric and magnetic fields $E=cB$ we can write;

$$A=cH^+, \quad B=cH^-, \qquad \text{c is speed of light}$$

Here, H^+ is positive color-charge and H^- is negative color-charge. In addition, in the above relation, c is a numerical constant that is relative to E and B in electromagnetic. So, if we can show that $c=\kappa$, then the above relation becomes:

$$A=\kappa H^+, \quad B=\kappa H^-, \qquad \kappa \text{ is a numerical constant}$$

When lots of H^+ enter into a photon, the intensity of the positive electric field increases. According to Maxwell equations, intensity of magnetic field increases, too. In addition, element C must carry magnetic effect around positive color-charges and for the same reason, for D element. Therefore, C and D are the same with opposite direction. So, according to the relationship between the intensity of electric and magnetic field we can write:

$$C=H^m, \quad D=-H^m$$

Then the above matrix becomes to following from the named CPH matrix:

$$[CPH]=\begin{bmatrix} \kappa H^+ \\ \kappa H^- \\ H^m \\ -H^m \end{bmatrix} \qquad (3)$$

According to above expression, we are able define the minimum magnitude of a photon. A tiny energy photon contains some positive color-charge H^+, negative color-charge H^-, right rotation color magnetic H^m and left rotation color magnetic $-H^m$, shown in CPH matrix (relation 3). This tiny energy is described as follows;

$$\text{Tiny enegy} = =E[(2\kappa+2)E_{CPH}] \qquad (4)$$

The energy of a CPH (E_{CPH}) defines in relation (6). Now, we are able to estimate some provable conceptions about the photon and introduce a new definition for the graviton.

4 Definition of a CPH

What is a CPH? Creative Particles of Higgs or CPH is an existence unit of nature. In other words, everything is made of CPH. Therefore, a CPH is appropriately referred to as the base unit of nature. Although, this not meant to be a particle as it has been referred to in physics.

A CPH is a particle with constant NR mass, m_{CPH} which moves with a constant magnitude speed of $V_{CPH} > c$ in any inertial reference frame, where c is the speed of light. According to the relation between mass-energy (relation 2), the NR mass of a CPH is defined relative to a photon's NR mass, given by;

$$m_{CPH} < m = \frac{h\nu}{c^2} \ \forall \ \nu, \qquad V_{CPH} > c \qquad (5)$$

The relationship between energy and momentum for NR mass CPH is described as follows;

$$\langle E_{CPH} \rangle = \langle |P_{CPH}| \rangle \ V_{CPH} = \text{constant} \qquad (6)$$

Relation (6) shows the energy of every CPH is constant, in any interaction between two (or more) CPH. So, when V_{CPH} decreases, it takes spin. Other word, in any inertial reference frame and Cartesian components;

$$|V_{CPH}(x)| + |V_{CPH}(y)| + |V_{CPH}(z)| = |V_{CPH}| \text{ , CPH has not spin} \qquad (7)$$

$$|V_{CPH}(x)| + |V_{CPH}(y)| + |V_{CPH}(z)| < |V_{CPH}| \text{ , CPH has spin} \qquad (8)$$

When CPH has spin, it calls graviton

Simply; a single graviton without spin is a CPH

If CPH with spin is called a graviton, we can therefore conclude that space is full of CPH. When the density of CPH increases in space, their distance decreases, then they feel and absorb each other. Suppose two CPH are moving on x-axis direction and absorb each other, their path's change without decreasing the magnitude of V_{CPH}. According to relation (6), we are able to construct an operator $R_z(\Delta\varphi)$, which rotates CPH by angle $\Delta\varphi$ about the x-axis (toward z-axis or y-axis) in position space. In addition, we can construct $T_z(\Delta\varphi)$ which rotates the CPH by $\Delta\varphi$ about the x-axis in spin space. We would expect such an operator to take the form;

$$T_z(\Delta\varphi) = \exp(-\frac{\mathrm{i}s\Delta\varphi}{\hbar}) \qquad (9)$$

Thus, according to this expression, two CPH rotated each other, they can not have the same direction spin. They spin with opposite direction, if positive color-charge has up spin, then negative color-charge must take a down spin. In general, their spin must satisfy of Pauli matrix.

5 Principle of CPH

CPH is a unit tiny energy with constant NR mass (m_{CPH}) that moves with a constant magnitude of speed equal $V_{CPH} > c$, in all inertial reference frames. Any interaction between CPH and the other existing particles presents a momentum of inertia **I** where the magnitude of V_{CPH} is constant and never changes. Therefore,

$$\nabla V_{CPH} = 0 \text{ in all inertial reference frames and any space}$$

Based on the principal of CPH, a CPH has two types of energy generated by its movement within its inertial frame. One is transfer and the other spin. In physics, we present energy summation (both kinetic and potential) by Hamiltonian equation and energy difference by LaGrange. Therefore, in case of CPH, we use Hamiltonian to describe the summation of energy generated by transfer and spin as following:

$$E_{CPH} = T + S \qquad (10)$$

(Where T is transferring and S is spinning energy of a CPH respectively.)

Since speed and mass of CPH is constant, then E_{CPH} =constant . CPH produces energy and energy produces Matter and Anti-Matter. In fact, everything is formed of CPH.

6 CPH and Cyclic group

As we explained in section 3, gravitons interact with each other and convert to color-charges and color-magnetism. In addition, when CPH has spin, we call it a graviton. Now we can define a cyclic group for electric field that generates by graviton.

So, G<g> given by;

$$G\langle g\rangle=\{nH^{+}, nH^{-} \mid n\in \mathbb{Z}\} \qquad (11)$$

Suppose 2k color-charges (k H^{+} and kH^{-}) combined and move in space. Therefore, there are two electric fields with opposite sign in space. About each field, a magnetic field forms that produces a graviton. According to sign of these fields, the direction of magnetic is different, so their elements are same. Therefore a cyclic group given by:

$$G\langle g\rangle=\{kH^{m} \mid k\in \mathbb{Z}\} \qquad (12)$$

We selected an integer number (not natural), because in red-shift color charges and the magnetic color of photon convert to gravitons.

7 Charged particles of CPH view point

In general, space is full of gravitons. Gravitons interact with each other and convert to color-charges. Some gravitons with same NR mass m_{CPH} convert to color-charges and two electric fields form. These fields cancel each other. However, positive color-charges repel each other, so the same action happens for negative color-charges. Therefore, when the intensity of color-charges grows, each field (negative and positive fields) forms a magnetic field. A magnetic field retains an electric field. This mechanism is explainable by Larmor radius (gyroradius or cyclotron radius) as follows;

$$r_g = \frac{mv_\perp}{|q|B} \qquad (13)$$

(Where r_g is the gyroradius, m is the mass of the charged particle, $v_\perp$ is the velocity component perpendicular to the direction of themagnetic field, q is the charge of the particle, and B is the constant magnetic field.)

This defines the radius of the circular motion of a charged particle in the presence of a uniform magnetic field. when color-charges change the structure of a photon, then magnetic-color changes too. Therefore, charge particles don't decay. Then we can write;

$$E = n(2\kappa + 2)m_{CPH}c^2 \qquad (14)$$

In generally, a photon is formed of two parts;

1- A lot negative color charges and magnetic color, magnetic color keeps negative color in a tube-like, so they form negative electric field. Let's show the minimum negative color charges with their magnetic color by $\triangleleft$, so that;

$$\triangleleft = (\kappa H^-, -H^m) \qquad (15)$$

2- Same as above; positive color charges with their magnetic color can be shown by $\triangleright$, so that;

$$\triangleright = (\kappa H^+, +H^m) \qquad (16)$$

The sign (+and -) of $(+H^{m}),(-H^{m})$ depend on their direction movement around color charges, in fact there is a kind of magnetic color in structure of photon.

Therefore, generally a photon given by;

$$n\left|\triangleleft\right\rangle + n\left|\triangleright\right\rangle = \left|E\right\rangle \qquad (17)$$

In quantum mechanics of plane waves of specific spin shows that a general field can always be written in terms of photons with a simple spin state and a general spatial wave function. Thus the fundamental entity, the photon can be considered quite generally to be a plane wave with a circularly polarized spin piece (Any field can be built from this basic ingredient). For simplicity, consider a photon traveling in the x direction or consider the direction of the photon as choosing the coordinate axis so that x point along the photons momentum. Every element in photon (relation 17), moves with momentum same as photon.

Dirac equation results for total energy given by;

$$E^2 = \left(\alpha_0 mc^2 + \sum_{j=1}^{3} \alpha_j c p_j\right)^2 \qquad (18)$$

Comparing the relationship (17) with the equation (18), the energy equation can be written as;

$$E^2 = \left(n\left|\triangleleft\right\rangle + n\left|\triangleright\right\rangle\right)^2 \qquad (19)$$

Root of relation (18) and (19), given by;

$$E_{-} = -\sqrt{\alpha_0 m_0 c^2 + \sum_{j=1}^{3} \alpha_j c p_j} = n \lhd = n(\kappa H^{-}, -H^{m}) \qquad (20)$$

$$E_{+} = +\sqrt{\alpha_0 m_0 c^2 + \sum_{j=1}^{3} \alpha_j c p_j} = n \rhd = n(\kappa H^{+}, +H^{m}) \qquad (21)$$

In pair production, relation (20) defines an electron and relation (21) defines a positron. We saw that a photon (γ -ray) produces two charges particles electron and positron with negative and positive charges. Before production, we have two electricity and magnetic fields. After production, there are two particles with electricity field and two weak magnetic fields around them.

This phenomenon shows an electric field that has no charge effect formed of two kinds of negative color-charge and positive color-charge. Moreover, in pair production, negative color-charges combine with each other and make negative charge, and positive color-charges combine with each other and make positive charge. The magnetic colors with different direction move around electron and positron.

Look at relations (20) and (21), given by;

$$E_{-} = n \lhd = n(\kappa H^{-}, -H^{m})$$
$$E_{+} = n \rhd = n(\kappa H^{+}, +H^{m})$$

The pair annihilates each other to form energy. In addition, there is no electric effect around the photons. So that;

$$n \lhd + n \rhd = \gamma + \gamma \qquad (22)$$

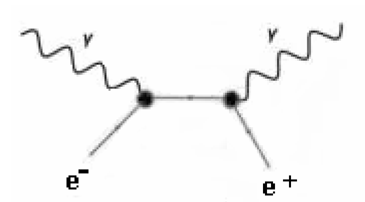

Fig1: annihilation of pair

In this process, each particle (electron and positron) decomposes to two parts. Each part of the electron combines with each positron and converts to quantum energy See figure1). This phenomenon shows that the electron is divisible. In modern physics, physicists use this phenomenon as a reason for proving the mass-energy equation $E=mc^2$, but in fact, there is an important conception in pair annihilation. Therefore;

$$n \lhd + n \rhd = (\frac{n}{2} \lhd + \frac{n}{2} \rhd) + (\frac{n}{2} \lhd + \frac{n}{2} \rhd) = \gamma + \gamma \qquad (23)$$

These photons are neutral and they carry two electric and magnetic fields. This phenomenon is acceptable only where two opposite charged particles separate and recombine again.

Now, we are at position where we are able to explain the mechanism of bosons productions. Accordingly, in the same way as fermions, bosons form of CPH too.

8 Gravity (gravitons)

To explain gravity force, let’s consider the Newton gravitaional law and revert back to the behaviour of a photon in a gravitational field. When a photon is falling in the gravitional field, it goes from a low layer to a higher layer density of gravitons. We should assume that the graviton is not a solid sphere without any considerable effect.

Graviton carries gravity force, so it is absorbable by other gravitons, in general gravitons absorb each other and combine.

When some gravitons are around a photon (or other particles) they convert to color charges and enter into the structure of a photon. Color charges around particles/objects intract with each other. So, around every particle exists a lot gravitons. Their effect is explainable with Newton gravitional law.

Let’s take a new look on the gravitional potetial energy formula. This formula shows potential ennergy is a field around a particle/object that is made of gravitons. Intensity of potential energy deppend to mass that given by;

$$U=-\frac{Gm}{r} \qquad (24)$$

(U is potential energy, G is gravitional constant, m is mass and r is distance center of object.)

If we use the relation (24) for a photon with mass $m=\frac{h\nu}{c^2}$, then we are able to get important results. There are many layers of gravitons around a photon. The first layer is closed with photon, so that its gravitons interact with color charges and magnetic color in the structure of a photon. The second layer interact with the first layer and third layer and so on. Therefore; when a stone is falling in the gravitational field of the Earth, two layers of gravitons are applied to it, first layer up (high h) and second down (high h-dh). In up, the density of graviton is greater than down, so the stone falls and its kinetic energy increases. When two objects with mass m_1 , m_2 and potential energy $U_1=-\frac{Gm_1}{r_1}$, $U_2=-\frac{Gm_2}{r_2}$, absorb each other and make a new object with math m_1+m_2 , its potential energy is given by;

$$U=-\frac{G(m_1+m_2)}{r}$$

Suppose m_1 has k_1 gravitons around it and m_2 has k_2 gravitons, then the new object has (k_1+k_2) gravitons in its gravitational field.

9 Electromagnetic fields

Maxwell equations and relations (relations 15 and 16, following formulas) and (16) lead us to revolving concept of virtual particle. This helps us to describe the electric field and interaction between charged particles. Also, this mechanism is able to explain how electric force converts to electromagtic energy in an electric field.

$$\triangleleft = (\kappa H^-, -H^m)$$
$$\triangleright = (\kappa H^+, +H^m)$$

Consider a charge particle that is emiting electric force particle contiously. There is no way to explain this phenomenon in modern physics or classical physics. This action has no effect on the properties of a charge particle such as its charge. How it is explained? If a charge paticle as a field generator has an output known as a virtual photon, what is it's input? We will explain the mechanism of electron and positron dynamics in the following section. The dynamics of other particles such as quarks are the same.

10 Dynamics of charge particles of CPH Theory view point

Consider the electron and positron that give by relations (20) and (21). The electron contains a set of negative color charges that keeps by magnetic colors. This rotational sphere-like (electron spinning) is in a sea of gravitons. Gravitons are negative and positive charges color. Around the negavitive color cherges of an electron is a magnetic field.

The electron has two opposite effects on color charges around itself. Negative color charges of electron absorb positive color charges (of space) and repels negative color charges. Magnetic field contracts positive color charges and repels them (see Ampere law).

Now we can define an operator for producing positive electric force partice. Let us show this operator by ($\lhd s$) per time that acts on the electron and produces positive electric force. So, it given by;

$$\frac{d}{dt} \lhd s = a \rhd = a(\kappa H^{+}, +H^{m}) \qquad (25)$$

There, a is a natural number. Consider that $\lhd s$ is a set of positive color charges, it makes a positive electric field around the electron. This electric field repels the negative charge particle, because every negative charge particle produces same electric field.

Same as above, positron produces a negative electric field around itself. So, it given by;

$$\frac{d}{dt} \rhd s = a \lhd = a(\kappa H^{-}, -H^{m}) \qquad (26)$$

When a negative electric force particle ($a \lhd$) reaches to positron, it combines with positive electric force particle $a \rhd$ and they convert to quantum energy, so that;

$$\left| a \rhd \right\rangle + \left| a \lhd \right\rangle = E \qquad (27)$$

This quantum energy transfers to the positron. Then, the positron accelerates toward the electron. The same process happens for the electron, and they absorb each other. For understanding, this process reconsiders to the annihilation of pair (section 7). Equations (25) and (26) let to design Figure2.

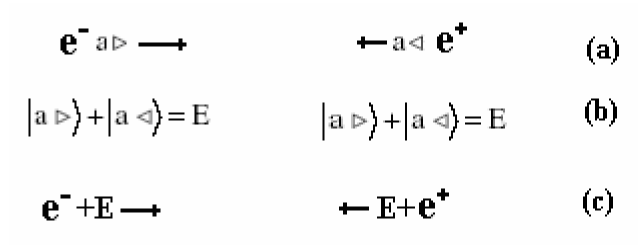

Fig2: process of electric force particles introduction

In figure (2a), charge particles (electron and positron) constrict color charges and emit to space. In figure (2b) two set of opposite color charge combine with each other and convert to energy. In figure (2c) charge, particles become energized and move toward each other.

Figure (3) shows the interaction between two opposite charge particles.

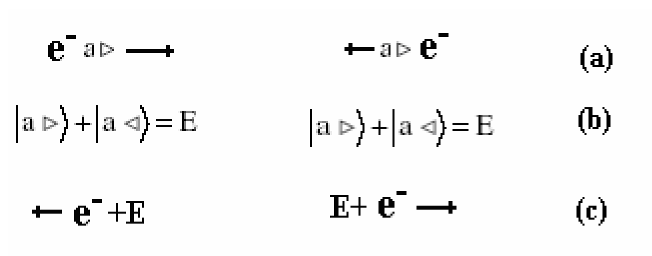

Fig3: Two opposite charge particle repel each other.

In fact, the structure of a virtual photon is difference from a real photon. There are different kinds exchange particles that carry electromagnetic force, one is a positive photon and other one is a negative photon. This point of view is able to easily explain the interaction between charge particles. In other words;

$$\frac{d}{dt} \triangleleft s = \gamma^{+} \qquad (28)$$

$$\frac{d}{dt} \triangleright s = \gamma^{-} \qquad (29)$$

And;

$$\gamma^{+} + \gamma^{-} = \gamma \qquad (30)$$

This view shows why a virtual photon is invisible.

11 Strong Interaction and CPH Theory

This section shows how positive charge particles absorb each other in very small distance. Generally, two positive charged particles produce banding energy, in small distances.

According to quantum chromodynamics, a proton is made of two up quarks (u) with (+2/3) charge and a down quark with (-1/3) charge. How it is that two up quarks with positive charged do not repel each other?

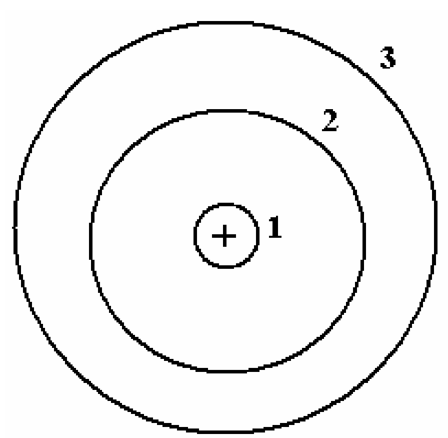

Fig4; Locations around each positive charged particle

Generally, suppose two positive charged particles A and B are at distance from each other. As explained in section 10**,** any positive charged particle absorbs negative color charges and repels positive color charges. When the distance between A and B is greater than the atomic radius, they emit negative photon γ^-. There are three locations around each positive charged particle (figure4).

In real space, every charged particle is plunging in a sea of gravitons. Location 3 (figure4) is full of gravitons that move with speed of $v \geq c$. When gravitons reach to location 2, electrical field (or magnetic field) of charged particle acts on them so that gravitons convert to positive and negative color charges. Positive charged particle repels positive color charges and absorbs negative color charges. Therefore, negative color charges enter into location 1 (figure 4). In location 1, negative color charges convert to negative photon that given by (relation 26);

$$\frac{d}{dt} \rhd s{=}a \lhd = a(\kappa H^{-}, -H^{m}) = \gamma^-$$

In general, location 3 is full of gravitons, location 2 is full of negative and positive color charges, and positive charged particle generates negative photon in location 1. Now suppose two positive charged particles (A^+ , B^+) are near each other that location 2 interferes with each other (figur5).

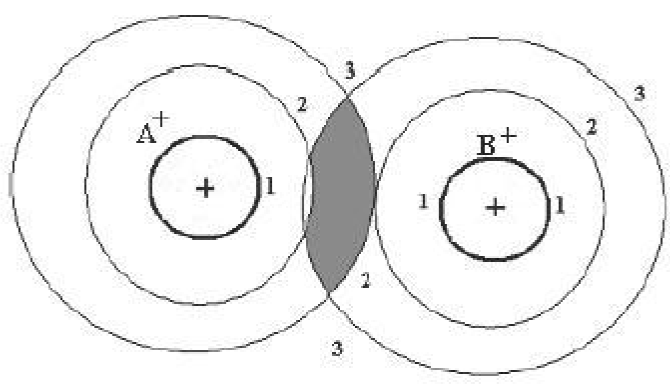

Fig5; interconnect two positive charged particles

Locations 2 of A and B interconnect (grey part in figure 2), there is a set color charges generated by A, described as follows:

$$\{(H^+, H^-) | H^+, H^- \in \text{field A}\}$$

Charged particle A repels positive color charges (H^+), they move toward B particle, and negative color charges (H^-) move toward A.

Also, charged particle B generates a set of positive and negative color charges (H^+, H^-) as follows;

$$\{(H^+, H^-) | H^+, H^- \in \text{field B}\}$$

Their direction movement is the opposite of A production. Therefore, in location 2, positive color charges H^+ from A and negative color charges H^- from B, have the same direction movement that is toward the B particle. They combine and convert to electromagnetic energy and move toward the particle B. The same action happens for positive color charges H^+ from B and negative color charges H^- from A; so, they form quantum energy that moves toward A. This shown as follows;

$$|a \rhd\rangle + |a \lhd\rangle = E$$

These energies form the banding energy between A and B. In a heavy nucleus, that contains a lot of protons, every quark interacts with each other and produces banding energy

Consider the centre of stars, two hydrogen ions (protons) move toward each other, when their distance decreases, then locations 2 of them interconnect and produce banding energy.

12 Weak interaction

The **weak interaction** is one of the four fundamental interactions of nature. In the Standard Model of particle physics, it is due to the exchange of the heavy Z^0 , W^+ , W^-. Its most familiar effect is beta decay (of neutrons in atomic nuclei) and the associated radioactivity. The word "weak" derives from the fact that the field strength is some 10^{13} times less than that of the strong force.

Since the weak interaction is both very weak and very short range, its most noticeable effect is due to its other unique feature: flavour changing. Consider a neutron (quark content *udd*; one up quark, two down quarks). Although the neutron is heavier than its sister nucleon, the proton (quark content *uud*), it cannot decay into a proton without changing the flavour of one of its down quarks. Neither the strong interaction nor electromagnetic allow flavour changing, so this must proceed by weak decay. In this process, a down quark in the neutron changes into an up quark by emitting a W^- boson, which then breaks up into a high-energy electron and an electron antineutrino. Since high-energy electrons are beta radiation, this is called a beta decay (figure 6).

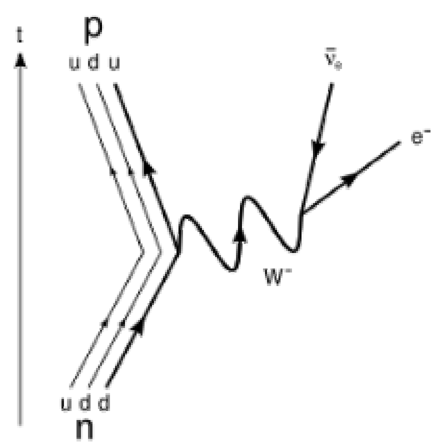

Fig6; Beta decay

$$^{137}_{55}\text{Cs} \rightarrow {}^{137}_{56}\text{Ba} + e^- + \overline{\nu}_e$$

In the above formula (figure 6), a neutron udd (udd, two down quarks $2\times -\frac{1e}{3}$ and one up quark $+\frac{2e}{3}$ electric charge) decays to a proton (uud $2\times +\frac{2e}{3}$ and $-\frac{1e}{3}$ electric charges), with $+e$ electric charge. Before reaction, there is no integer charge in neutron structure, but after reaction, there is an electron with –e electric charge. Suppose an electron were formed of $E_- = n\triangleleft$, therefore, a down quark given by $\frac{n\triangleleft}{3}$, and an up quark shown by $\frac{2n\triangleright}{3}$. It is attendable that a quark over that negative (or positive) color charges contains electromagnetic energy ($|a\triangleright\rangle + |a\triangleleft\rangle = E$), so the mass of up quark is not equal the mass of $\frac{2n\triangleright}{3}$.

For example; in β^+ decay with +e electric charge that is equivalent of $n\triangleright$, consider the following relation;

$$\text{energy} + p^+ \rightarrow n^0 + e^+ + \nu_e$$

A n^0 contains two down quarks [$2\times$ ($-\frac{1e}{3}$ or $\frac{n\triangleleft}{3}$)] and one up quark ($+\frac{2e}{3}$ or $\frac{2n\triangleright}{3}$), but a proton contains [$2\times$ ($\frac{2n\triangleright}{3}$ or $+\frac{2e}{3}$)] and one down quark ($-\frac{1e}{3}$ or $\frac{n\triangleleft}{3}$).

So, in above formula, energy separates color charges and recombines them in a new form. There is a positron with integer $(n\triangleright$ or $+e)$ electric charge, in right side of above formula, but there is not so integer electric charge, in left side. Therefore, electric charge of particles is not stable, but the color charges conserved. It meant that the sum number of negative and positive color charges is equal in any reaction.

Therefore, vector bosons Z^0 و W^+ , W^- given by;

$$W^+ \sim n \rhd$$

$$W^- \sim n \lhd$$

$$Z^0 \sim (k \rhd + k \lhd)$$

Summary;

There are many ambiguities in modern physics that formal theories are not able answer. However, CPH theory view point gives a new way to look at the problem and it is able to resolves it by using the new definition of graviton and negative and positive color charge conception. This view shows how particles appear and when Spontaneous Symmetry Breaking has occurred.

$$|V_{CPH}(x)| + |V_{CPH}(y)| + |V_{CPH}(z)| = |V_{CPH}| > c \text{ , CPH has not spin}$$

CPH is isolation that never seems.

$$|V_{CPH}(x)| + |V_{CPH}(y)| + |V_{CPH}(z)| < |V_{CPH}| \text{ , CPH has spin}$$

When CPH has spin, it calls graviton

Space (vacuum) is full of CPH (gravitons), and CPH produces energy.

$$|V_{CPH}(x)| + |V_{CPH}(y)| + |V_{CPH}(z)| \geq c$$

Gravitons convert to negative and positive color charges and magnetic color.

$$\left|V_{CPH}(x)\right| + \left|V_{CPH}(y)\right| + \left|V_{CPH}(z)\right| \leq c$$

Electric and magnetic fields appear.

$$\left|V_{CPH}(x)\right| + \left|V_{CPH}(y)\right| + \left|V_{CPH}(z)\right| < c$$

Spontaneous Symmetry Breaking has occurred. Moreover, fundamental particles appear, then fermions and bosons interaction with each other. For example, reconsider pair production, before pair production, there is a photon only. There is an electron a positron and virtual photon (boson) that carries electric force, after pair production.

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