

English CPH E-Book

Section 4

Analysis of CPH Theory

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Introduction

The beginning of the 20th century brought the start of a revolution in physics. The long-held theories of Newton were shown not to be correct in all circumstances. Not only did quantum mechanics show that the laws of motion didn't hold on small scales, but even more disturbingly, general relativity showed that the fixed background of space-time, on which both Newtonian mechanics and special relativity depended, could not exist. Einstein formulated the theory of special relativity, unifying space and time into a single entity, space-time.

Attempts to unify quantum mechanics and general relativity made significant progress during the 1990s. At the close of the century, a Theory of everything was still not in hand, but some of its characteristics were taking shape. String theory, loop quantum gravity and black hole thermodynamics all predicted quantized space-time on the Planck scale.

Today, one of the major goals of particle physics is to unify the various fundamental forces in a **Grand Unified Theory**.

The **grand unification energy**, or the GUT scale, is the energy level above which, it is believed, the electromagnetic force, weak force, and strong force become indistinguishable from each other. The electromagnetic and weak forces become indistinguishable at a lower energy level, forming the electroweak force, and gravitational force requires an even higher energy level to unify with the other three. Grand unification theories (GUTs) attempt to make predictions regarding the grand unification energy and the characteristics of the three unified forces.

What CPH Theory reclaimed is that we never can unify forces or find unification energy, if we have not a new definition of energy and relationship between fermions and bosons. In fact great mystery for finding a GUT theory neither does nor resolved without notice to conversion force and energy.

With Best Regards
Hossein Javadi

Conversion boson and mass-energy

In any interaction between force and mass that mass-energy increases, boson converts to mass-energy. And when mass-energy lose, then mass-energy converts to boson.

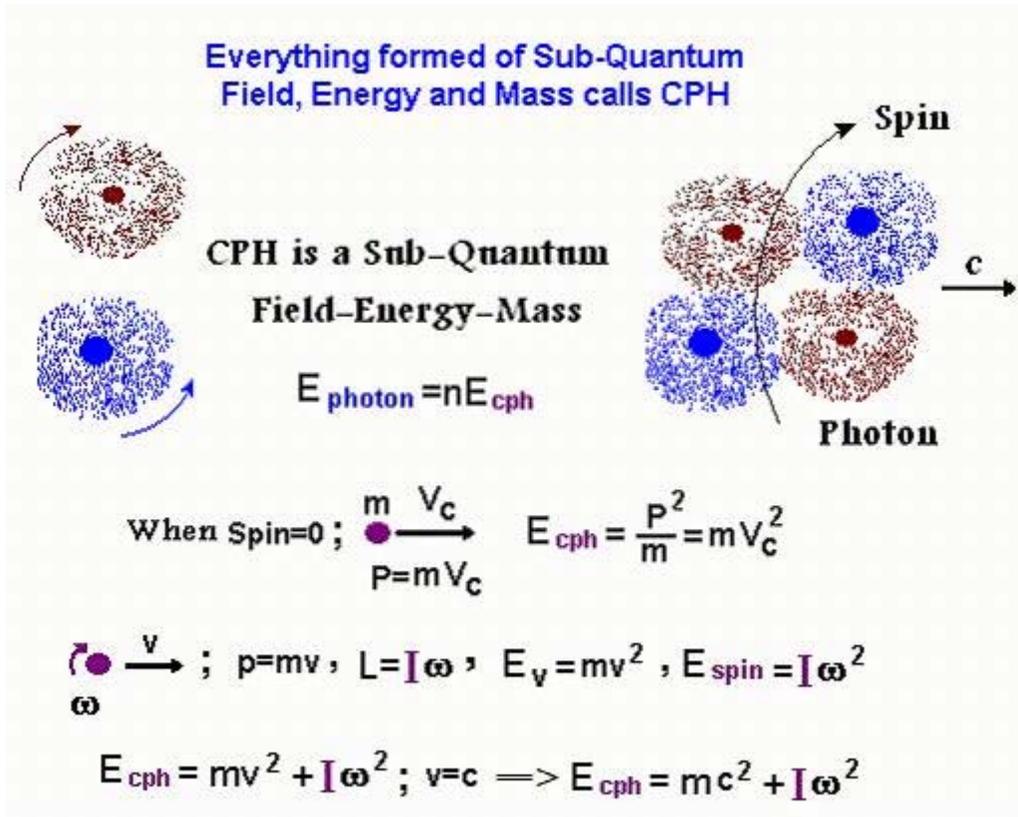
As relativity showed when force applied on a particle/object its mass increases, which;

$$F = dp/dt = d(mv)/dt = vdm/dt + m dv/dt$$

or

$$m = \frac{m_0}{\sqrt{1 - v^2/c^2}}$$

So, the mass is function of its velocity. How the velocity does change? As a force acts on a particle/object, its velocity changes, only. For explaining relativistic mass and interaction between mass and force let do explain a few examples by using the CPH Theory. Of the first do consider that everything has formed of CPH. CPH has two kinds energy, one is its transfer energy (it moves of a place to another place by time), and other energy depends to its spin (below picture).



So, kinetic energy of photon depends to kinetic energy of CPHs that are in the structure of photon, so that;

$$E_{\text{photon}} = nmc^2, n \text{ is the number CPH in photon}$$

How graviton (color-charge) exchanges?

As explained in section 3, gravity is a currency among objects that has formed of gravitons. In fact gravitons are two kinds, positive color-charge and negative color-charge.

Suppose a shot is staying on the surface of earth. According to Newton's 3rd law,

$$F_e = -F_s$$

F_e is force that earth applied on shot and F_s is force of shot to the earth. In fact a graviton of earth enters to structure of shot. Suppose it is a positive color-charge. So the nearest electron absorbs it.

Notice; this item is very important. When positive color-charge enters to electron, it is not able does annihilate the electron's charge. But electron keeps its normal charge, so electron expels it. Positive color-charge pulls electron beyond it, because it has positive electric effect. This pulling applied of electron to other particles in structure of atom and of atom to other atoms and so on. So, shot is attracting toward the earth. When this positive color-charge reaches to earth, the same interaction happens. In this case shot and earth are balancing to exchanging the graviton. Because, they are reply same in the number of gravitons.

Ballistic

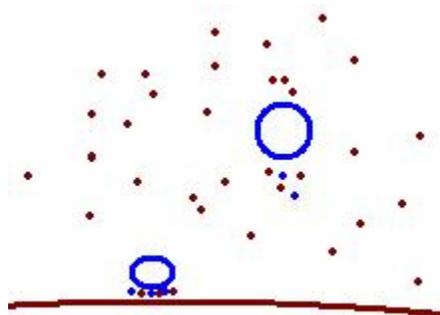
I take a shot on my hand and bring it upward the earth whit constant velocity. Its situation changes relative the earth. When shot is moving with constant velocity by my hand, two forces applied on it. One of them is upward by hand and other one is toward the earth by gravity force (gravitons).

My hand gives a CPH (color-charge) into shot and putting it upward the earth. And a graviton leaves shot and pushing it toward earth (on my hand). So its mass is stable. Also gravitons (of gravity field) enter into shot, but shot exchanges them like above explaining (earth gravity and shot are balanced). When shot reaches to high h, I drop it. Gravitons pushing shot toward earth and it falls. In during shot is falling, two kinds graviton reaches to it. One kind of the earth and shot exchanges them like above item, and other kind color-charges (negative and positive) that shot is unable exchanges them. So, lots of them converts to kinetic energy, and shot moves toward the earth.

Shooting shot

I take a shot with mass m and shooting it with velocity v upward. Shot takes kinetic energy. The action of my hand on shot is applying force on it, only. In the other word, in during dt , n color-charges (as energy) leave my hand, convert to force, enter into shot and convert to energy again. So, shot takes kinetic energy equal $1/2mv^2$.

When shot is moving upward, it is exchanging graviton (color-charges) with the earth. But shot is moving in a gravitational field, it is full of gravitons (color-charges) that they are moving toward the earth. Gravitons enter into structure of shot, that shot is unable exchanges all of them (below picture). So, momentum of shot changes and gradually it loses kinetic energy until does stop.



In left side shot is on the earth, shot and earth are exchanging equal graviton.
 In the right side number of gravitons that enter is greater than leave.
 So, kinetic energy of shot does change.

In usual case suppose force F (in above example gravity force) applied on an object with mass M and its velocity changes of v_1 v_2 , so, N CPH enter into structure of object, that appear on a kind of energy. Every CPH has mass and energy m and v (in an inertial frame). So, F force (in this case the earth gravitational field) loses N graviton that they add to object's mass. So, we have;

$$\bar{F} = \frac{\Delta P}{\Delta t}, \Delta P = M_2 V_2 - M_1 V_1 = N m v, F \text{ loses } N \text{ CPHs}, M_2 = M_1 + N m$$

When $N < 0$, the speed of object decreases (like shot is moving upward).

When $N > 0$, the speed of object increases (like shot is moving toward).

When $N = 0$, object keeps its energy (like shot is staying on the earth).

So,

$$W = \Delta E = \Delta M c^2 = N m c^2$$

That W is work, ΔE changing energy, ΔM changing mass, c speed of light, N number of CPH, m mass of a CPH.

When $W > 0$, energy (mass) increases. When $W < 0$, energy (mass) decreases.

When $W = 0$, energy (mass) does not change (Following picture).

Newton's Second Law

When Force F applied on an object with mass M_1 and velocity V_1 , N CPHs enter to object. A CPH has mass m and limit speed of v in experintal frame. Then F loses N CPH.

$$\bar{F} = \frac{\Delta P}{\Delta t} \cdot \Delta P = M_2 V_2 - M_1 V_1 = Nm v \cdot F \text{ loses } N \text{ CPHs} \cdot M_2 = M_1 + Nm$$

Work

$$W = \int_0^r F \cdot dr = \text{Energies of } N \text{ CPHs}$$

$W=0$, number of CPH enters to object is equal that the number of CPHs leave it. Like object is on the sureface of the earth.

$W>0$, CPH enter to object. $W<0$, CPH leave object

Generator

I do rotating the dynamo of a generator and produce electromagnetic energy. I apply force on dynamo and it rotates. The magnetic field of dynamo's magnet does change. The electric charge of electrons in wires, those are around the dynamo doing opposite with changing the magnetic field. Then electromagnetic energy produces. How and why rotating dynamo produces electromagnetic energy?

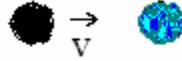
My hand's force does rotating the dynamo, only. In the other world, in during rotating dynamo my body's energy changes to force (CPH), and force changes to mechanical energy.

When the magnetic field changes, then electric field does change. Changing electric field does change the electron motion. But we know force is able to changing the motion of every thing. So, electron takes gravitons (color-charges) and condenses them, and produces a quantum electromagnetic energy.

Collision

Suppose shot A with mass m and velocity v is moving toward the shot B with mass m that is rest (masses are equal). A collides to B. Suppose after collision A is stable and B moves with velocity v (following picture).

Before collision:



Shot A; $m+1/2mv^2$, shot B; m .

All of CPH in A are moving with their inertia same as A.
Please remember the Newton's first law.

After collision;



Shot A; m , shot B; $m+1/2mv^2$

In during collision a number CPH leave shot A, and enter into shot B. The Momentum of these CPHs do change momentum (and mass-energy) shpts. Shot A stops and shot B moves (see following).

Before of colision

Shot A: $m+nmc^2$ and Shot B: m

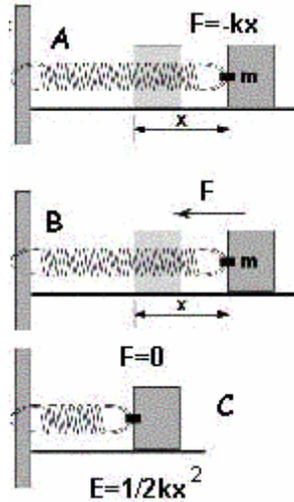
After of colision

Shot A: m and Shot B: $m+nmc^2$

That n is the number of CPH leave shot A and enters to shot B.

Spring

Take a look at spring. There is a spring with one of its sides connected to the wall (Figure). In formal physics it is defined by the conversion of potential energy and kinetic energy. Let us explain it according to the conversion of force and energy.



A. The spring is pushed by hand. During the time that hands were pushing the spring, hand's energy converts to force. In fact a lot of CPHs leaves the hand and enters the spring. Hand loses momentum and energy. Spring (and object) takes momentum and energy. We know the force of spring gives by relation;

$$F = - kx$$

that applied toward the left side. In during we are pushing spring, a number CPH enters to object and of object enter to spring. The momentum (and energy) of these CPH is transferred to the object and spring. These CPHs converts to force, when they enter to spring, and that cause sprig applies force.

In during we are act on object (and spring), n CPH leave hand and enter to object. And m CPH leaves object and enter to spring ($m < n$). When we drop object, it does stop and spring pushes object toward the left side.

B. Force is converting to energy. Spring will return to its equilibrium situation. Object opposes with the spring's movement. The force of the spring converts to energy and the amount of force decreases and energy increases.

C. No force is applied on an object, but energy is maximum; the Object is moving toward the left side and its energy converts to force (in spring).

CPH and Charge and electricity force

A big mystery in theoretical physics is how charge produces and emits electricity force? Physicists think that all forces are caused by the exchange of particles.

In the same way, the electromagnetic force is carried by particles called **virtual photons**. Two negatively charged electrons will exchange these virtual photons and push each other apart. Notice that they are sending virtual photons out in every direction.

A charge particle has an electricity field around itself. Also, every field is formed of lots particles that are carrying force. The strong nuclear force acts between quarks (and between hadrons which are made up of quarks). The particle that carries the force is called the **gluon**. And proton is formed of three quarks. But the charge of a proton is a unit of charge in electrodynamics. In this explaining suppose a proton is a unit of charge particle. It has no effect on this explain, and we can generalize to quarks charge. But of the first it is necessary do attends to production and annihilation pair again.

Pair production

Pair production is a great experience that is able helps us to answer many mysteries of universe. Pair production and annihilation is an empirical example of equivalence relation mass and energy. Dirac had solved the equation;

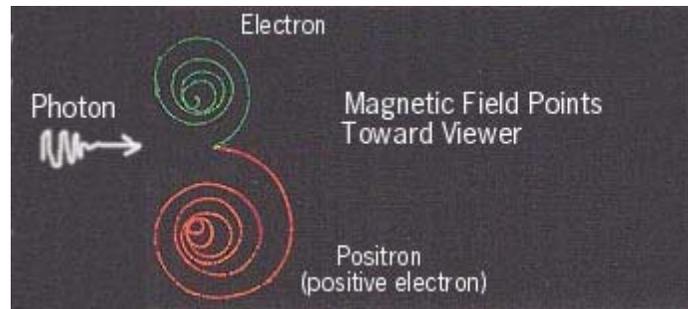
$$E^2 = c^2 p^2 + (m_0^2 c^2)^2$$

in form of;

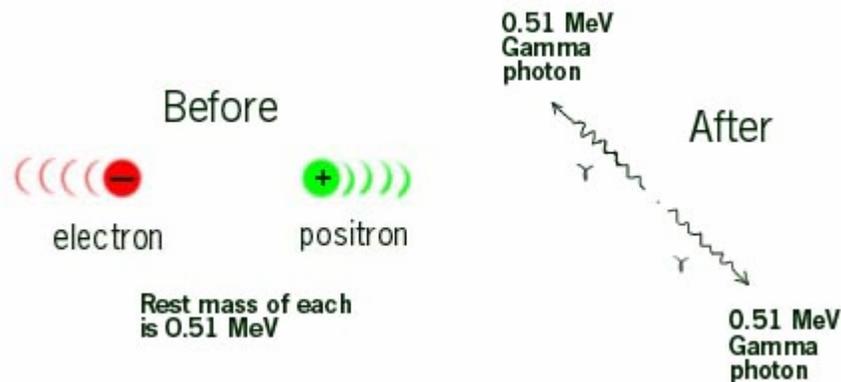
$$E = \pm \sqrt{c^2 p^2 + (m_0^2 c^2)^2}$$

Dirac had not removed negative part of its answer. He thought and analyzed it. Then he guessed there is anti-electron in nature.

This is because the process is a result of a γ ray converting to an electron-positron pair. In the process, the γ ray is converted to an electron positron pair as shown schematically in figure. As the positron slows down, further annihilation takes place resulting in the production of two photons.



Pair production electron and positron



Annihilation pair electron-positron

These days pair production is a usually experiment. In 1955 physicist produced proton and anti-proton in laboratory. But as mentioned in beginning of item, I will explain how charge particles produce electricity force. But attention to pair production is a great tool for this.

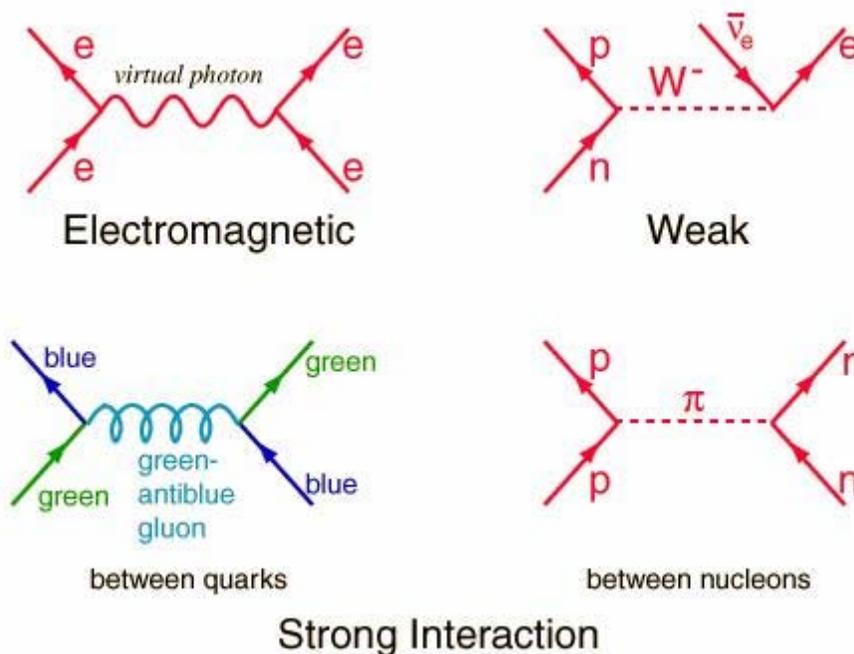
We know before of pair production there is a photon that has no charge. But after of pair production there are two charge particles, electron with negative charge and positron with positive charge. These charge particles have two electricity fields. We cannot passing of this phenomenon, because consideration to this fact is able to open a new way for understanding the essence of charge and effective charges.

Exchange Particles in Quantum Theory

All elementary particles are either bosons or fermions (depending on their spin). The spin-statistics theorem identifies the resulting quantum statistics that differentiate fermions and bosons.

Interaction of virtual bosons with real fermions is called fundamental interactions. Momentum conservation in these interactions mathematically results in all forces we know. The bosons involved in these interactions are called gauge bosons - such as the W vector bosons of the weak force, the gluons of the strong force, the photons of the electromagnetic force, and (in theory) the graviton of the gravitational force.

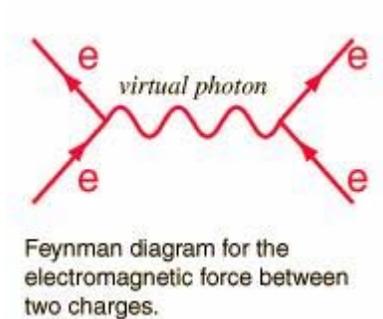
In particle physics, **gluons** are vector gauge bosons that mediate strong color charge interactions of quarks in quantum chromodynamics (QCD). Unlike the neutral photon of quantum electrodynamics (QED), gluons themselves participate in strong interactions. The gluon has the ability to do this as it itself carries the colour charge and so interacts with itself, making QCD significantly harder to analyze than QED.



Since gluons themselves carry color charge (again, unlike the photon which is electrically neutral), they participate in strong interactions. These gluon-gluon interactions constrain color fields to string-like objects called "flux tubes", which exert constant force when stretched. Due to this force, quarks are confined within composite particles called hadrons. This effectively limits the range of the strong interaction to 10^{-15} meters, roughly the size of an atomic nucleus.

The photon is the exchange particle responsible for the electromagnetic force. The force between two electrons can be visualized in terms of a Feynman diagram as shown below.

The infinite range of the electromagnetic force is owed to the zero rest mass of the photon. While the photon has zero rest mass, it has finite momentum, exhibits deflection by a gravity field, and can exert a force.



The photon has an intrinsic angular momentum or "spin" of 1, so that the electron transitions which emit a photon must result in a net change of 1 in the angular momentum of the system. This is one of the "selection rules" for electron transitions

Photon And electricity charge

Photon carries two fields, an electricity field and a magnetic field. But it is not enough to get what we are look forward. So, we return to gravitational effect on photon. But in this case we must have a new look and do summarize our results.

We saw in section 2 that a photon has mass that gives with;

$$m = h\nu/c^2$$

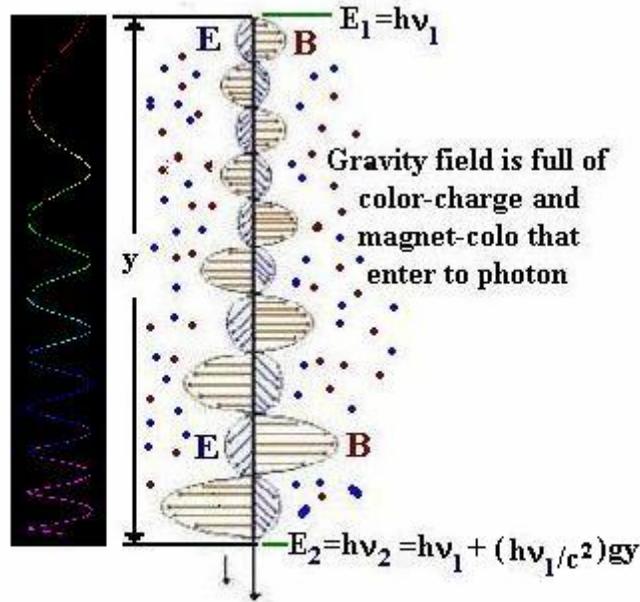
So, its weight is equal;

$$mg = (h\nu/c^2)g$$

Suppose photon fall distance y toward the earth. So, its energy reaches to;

$$h\nu' = h\nu + mgy$$

Following picture shows moving photon in gravitational field. Gravitons (color-charges and magnet-color) enter into structure of photon and its energy (mass), frequency, and intensity of electricity field and magnetic field increase.



When photon falls in gravitational field it's intensity of electric and magnetic fields increases.

If we consider to below relation on the earth gravitational field, only;

$$hv' = hv + mgy$$

According the amount of Plank constant and intensity of earth's gravity, there is not important change for frequency of photon. But it is questionable in high intensity gravity fields, is this effect very considerable? Answer is yes, because there is very massive body with very high intensity gravity in the universe.

However, experiments show changing them is measurable on the earth. We accepted that photon's energy changes and this energy is using to production pair electron and positron. Two charge particles with opposite electricity fields. Now look at;

Work of gravity → electromagnetic energy → electric charge

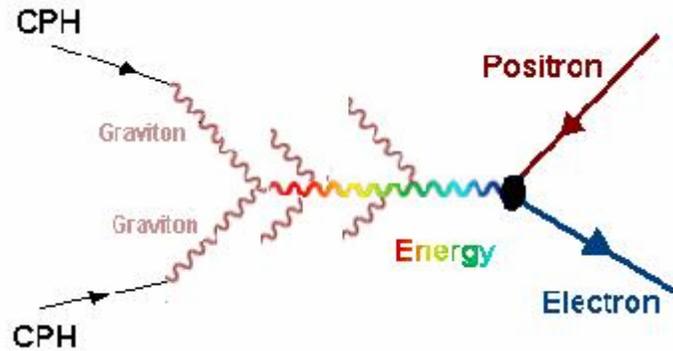
Electric energy + magnetic energy = electromagnetic energy

Electromagnetic energy → negative and positive particle charge

They inform that;

- 1- Gravitational field is formed of exchangeable particles that have electricity and magnetic effect (color-charge and magnet-color).

- 2- Color-charges combine and produce charges particles.
- 3- Color-charges are two opposite sign, negative and positive that there are in the structure of photon.
- 4- In production matter and anti-matter, negative color-charges combine with each other, and positive color-charges combine with each other too, than they do form positive and negative charge particles (see following picture).



- 5- The reason that gravitons combine with each other is that they have color-charge effect. So, space is able produces energy.
- 6- Charge Particles have electricity field and produce and emit electric force particles.
- 7- Charge particles have a weakly magnetic field too.

According the above items we can explain electricity charges and electricity field.

CPH Theory and Electrodynamics

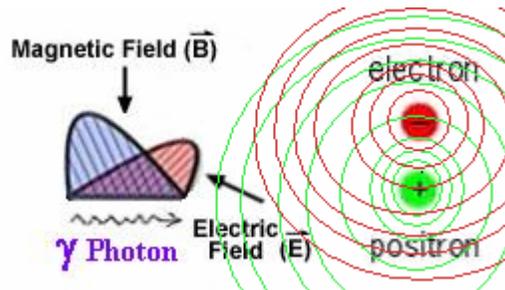
There is a relationship between electricity and magnetic field in electrodynamics.

$$c = \frac{E}{B}$$

According the light speed this relation shows electricity field is vary stronger than magnetic field. Also, quantum electrodynamics accepted that magnetic energy of a photon is very low relative the electricity field.

Return to pair production again. 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 weakly magnetic fields around them.

This phenomena shows electricity field that has no charge effect is formed of two kinds negative color-charge and positive color-charge. And in pair production negative color-charges combine with each other and make negative charge. Also, positive color-charges combine with each other and make positive charge (following picture).



There is negative and positive color-charges in the left side.
There are two positive and negative charge particles in the right side, that they have weakly magnetic fields.

How charge produces electric field?

When photon produces pair, electron and positron show their effective charge. These affects appear by their electricity field. Charge particle emits photons that they carry electricity forces.

Now consider to electron that is formed of negative color-charges that they have combined with each other. Electron is swimming in an ocean of color-charges (gravitons). Electron like a generator condenses negative color-charges and emits them. Then electricity field does appear. Electron is same a machine that its input is color-charges and output is **virtual photons**. So;

Negative Color-charge + Positive Color-charge + Magnetic-color → Photon

Photon → charge particles



Negative virtual photons move toward the **positive** charges and **Positive** virtual photons move toward the **Negative** charge.

Particle exchange in CPH Theory

As I told before particle charges use color-charges that exist in perimeter produce **virtual photons**. Electron produces negative virtual photon and proton produces positive virtual photon. So, they put out electricity fields around themselves.

Now look at two charge particle with different sign (an electron and a proton). Proton emits positive virtual photons. Photon moves toward the electron. Electron absorbs it. When photon enters into structure of electron, charge of electron does unbalance. So, electron does decay virtual photon to positive color charge toward the proton. But positive color-charges have positive effect charge, they were pulling electron beyond themselves. The same case happens for proton and negative virtual photon. And they (electron and proton) absorb each other. Any electrical interaction does like this.

Effect of gravity on Radio electromagnetic waves

As we know according Relativity frequency of electromagnetic waves obey of following formula;

$$\nu' = \nu \left(1 \pm \frac{GM}{rc^2} \right) \text{ and } E = h\nu$$

Pound-Rebka experiment had used for γ -ray that has very great frequency. But in CPH Theory red-shift and blue-shift depends to structure of photon and the number of CPH in photon. When photon contains enough CPH (as like γ -photon), it obey of above relation. But for low frequencies like Radio electromagnetic wave, a color-charge enters to it very hard. So, according CPH Theory effect of gravitational field on electromagnetic waves is a probably function, that given by;

$$P(\text{GEMW}) = P(\text{Gravity effect on EMW}) = \frac{\text{Energy of Photon}}{\text{Energy of Gamma Photon}}$$

So, relation changes to following form.

$$\nu' = P(\text{GEMW}) \nu \left(1 \pm \frac{GM_s}{R_s c^2} \right)$$

For more explain, see following picture.

The Effect of Gravitation on EMW is a Probably Function

Gravitation Effect on Electromagnetic Waves

$$P(\text{GEMW}) = P(\text{Gravity effect on EMW}) = \frac{\text{Energy of Photon}}{\text{Energy of Gamma Photon}}$$

A Photon in a Gravitational Field

$$\Delta E = P(\text{GEMW}) \int_{m_0}^m \int_{g_0}^g \int_{h_0}^h dm \, dg \, dh$$

m is mass of photon
g is gravity intensity
h is high

for radio wave, $P(\text{GEMW})$ is around 10^{-15}

for white light, $P(\text{GEMW})$ is around 10^{-6}

for CPH, $P(\text{GEMW})$ is very less than 10^{-20}

for Blue-Shift ΔE is positive

for Red-Shift ΔE is negative

When energy of photon is equal or greater energy of γ - photon, $P(\text{GEMW})=1$

When frequency is decreasing, the effect of gravitational field does decrease too.

And in the end of electromagnetic waves that they are color-charge, the effect of gravitational field goes to zero. For this reason gravitons (color-charges) are able escape of massive body's field. And massive bodies like black hole (no absolute black hole) are not able eat gravity effect.

With Best Regards

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