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# Theory of CPH

## Quantum Electrodynamics and CPH Theory

**Hossein Javadi**

Javadi_hossein@hotmail.com

**Introduction;**

Quantum electrodynamics (QED) is a relativistic quantum field theory of electromagnetism. Feynman's mathematical technique, based on his diagrams, describes all phenomena involving electrically charged particles interacting by means of exchange of virtual photons, whether the interaction is between light and matter or between two charged particles.

# Quantum Electrodynamics and CPH Theory

This article shows difference between real photon and virtual photon. According to CPH Theory a photon is formed of a lot of CPH that they named negative color charge, postive color charge and magnetism color in structure of photon. Negative color charges form the negative photon, and postive color charges form the postive photon that they are anti particles for each other.

This article is based on definition of CPH and principle of CPH. So, for more explain about CPH see following articles;

http://www.wbabin.net/science/javadi5e.pdf

http://wbabin.net/science/javadi23.pdf

http://www.wbabin.net/science/javadi14e.pdf

For all CPH articles see following link;

http://cph-theory.persiangig.com/english.htm

## 1 Charged particles of CPH Theory view point.

According to CPH Theory a photon is formed a lot gravitons that call color charges and magnetism color in structure of photon. Energy of a photon given by;

$$E=n(2\kappa+2)m_{CPH}c^2 \qquad (1)$$

There, n is a natural number, $m_{CPH}$ is mass of a CPH and $\kappa$ is a pure number that shows relation between color charges and magnetism colors in structure of photon (see link 1in references).

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In generally, a photon forms of two parts;

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

$$\triangleleft = (\kappa H^{-}, -H^{m}) \qquad (2)$$

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

$$\triangleright = (\kappa H^{+}, +H^{m}) \qquad (3)$$

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

Therefore, generally a photon given by;

$$n|\triangleleft\rangle + n|\triangleright\rangle = |E\rangle \qquad (4)$$

In quantum mechanics of plane waves of specific spin shows that a general field can always written in terms of photons with a simple spin state and a general spatial wave function. Thus the fundamental entity, the photon can consider quite generally to a plane wave with a circularly polarized spin piece (Any field 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 (relation1) moves with momentum same as photon.

Now consider to Dirac energy formula that given by;

$$E^{2} = \left( \alpha_{0} mc^{2} + \sum_{j=1}^{3} \alpha_{j} cp_{j} \right)^{2} \qquad (5)$$

If we replace energy relation (4) into relation (5), and then we can write;

$$E^2 = \left(n\left|\triangleleft\right\rangle + n\left|\triangleright\right\rangle\right)^2 \qquad (6)$$

By combining the root of relations (5) and (6), given by'

$$E = \pm \sqrt{\alpha_0 m_0 c^2 + \sum_{j=1}^{3} \alpha_j c p_j} \qquad (7)$$

$$E_- = -\sqrt{\alpha_0 m_0 c^2 + \sum_{j=1}^{3} \alpha_j c p_j} = n \triangleleft = n(\kappa H^-, -H^m) \qquad (8)$$

$$E_+ = +\sqrt{\alpha_0 m_0 c^2 + \sum_{j=1}^{3} \alpha_j c p_j} = n \triangleright = n(\kappa H^+, +H^m) \qquad (9)$$

Relation (8) describes an electron and relation (9) describes a positron in pair production phenomenon.

## 2 electromagnetism fields

The magnetic field is produced by the motion of electric charges, electric current. Also, a changing magnetic field produces an electric field. Similarly, a changing electric field generates a magnetic field.

Because of this interdependence of the electric and magnetic fields, it makes sense to consider them as a single coherent entity—the electromagnetic field. This unification, which was completed by James Clerk Maxwell, and formulated by Oliver Heaviside.

Maxwell equations and relations (8) and (9) lead us to revolving concept of virtual particle. This looking helps us to describe the electric field and interaction between charged particles. Also, this mechanism is able explain how electric force converts to electromagtism energy in an electric field.

Consider to a charge particle that is emiting electric force particle contiously. But ther is no explaing for this phenomenon in modern physics or classical physics. This action has no effect on propetiies of charge particle such as its charge. How it is explainable? A charge paticle as a field generator, its output is virtual photon, what it input is? I will explain the mechanism of electron and positron dynamics in following. The dynamics of other particles such as quarks are same.

## 3 Dynamics of charge particles of CPH Theory view point

Consider to electron and positron that give by relations (8) and (9). Electron contains a set of negative color charges that they keeps with by magnetism 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 electron is a magnetism field.

The electron has two opposite effects on color charges around itself. Negative color charges of electron ansorb positive color charges (of space) and repl negative color charges. Magnetism field contracts positive color charges and repls 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 electron and produces positive electric force. So, it given by;

$$\frac{d}{dt} \lhd s = a \rhd = a(\kappa H^{+}, +H^{m}) \qquad (10)$$

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.

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

$$\frac{d}{dt} \rhd s = a \lhd = a(\kappa H^{-}, -H^{m}) \qquad (11)$$

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;

$$\left| a \rhd \right\rangle + \left| a \lhd \right\rangle = E \qquad (12)$$

This quantum energy transfers to positron. Then positron accelerates toward the electron. Same process happens for electron, and they absorb each other. For understanding, this process reconsiders to the annihilation of pair (electron and positron). Look at relations (8) and (9), given by;

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

Pair annihilates to energy. In addition, there is no electric effect around the photons. So that;

$$n\lhd+n\rhd=\gamma+\gamma \qquad (13)$$

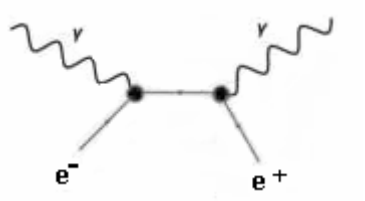


Fig1: annihilation of pair

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

$$n\lhd+n\rhd=(\frac{n}{2}\lhd+\frac{n}{2}\rhd)+(\frac{n}{2}\lhd+\frac{n}{2}\rhd)=\gamma+\gamma \qquad (14)$$

Let us come back to electric fields process. Equations (10) and (11) let to design Figure2.

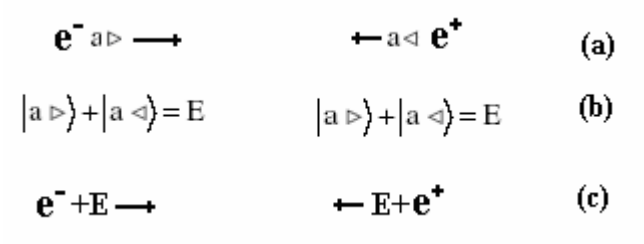


Fig2: process of electric force particles introduction

In figure (2a), charge particles (electron and positron) do 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 particle get energy and move toward each other. Figure (3) shows interaction between two opposite charge particle.

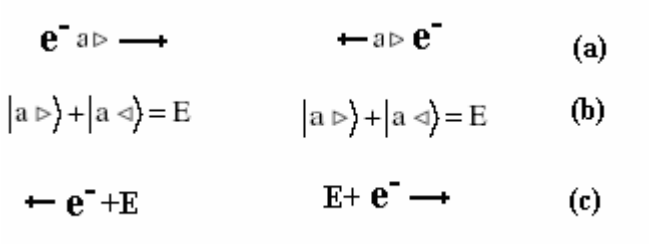


Fig3: Two opposite charge particle repel each other.

In fact, structure of virtual photon is difference of real photon. There are different kind exchange particles that carry electromagnetism force, one is positive photon and other one is negative photon. This view of point is able explain interaction between charge particles very easy and witnessed. In other word;

$$\frac{d}{dt} \triangleleft s = \gamma^{+} \qquad (15)$$

$$\frac{d}{dt} \triangleright s = \gamma^{-} \qquad (16)$$

And;

$$\gamma^{+} + \gamma^{-} = \gamma \qquad (17)$$

This looking shows why virtual photon is invisible.

References;

1 - http://wbabin.net/science/javadi23.pdf
2 - http://physics.ucr.edu
3 - http://physics.bu.edu/py106/Notes.html
4 - http://www.physics.csbsju.edu
5- http://cph-theory.persiangig.com/