Electron and Photon Form A System on Atomic Orbit

T.Spiegelman
tnts2595@gmail.com, south korea, ulsan, dongsan-ro-78

July 10, 2018

Abstract

By assuming that Maxwell's displacement current is resulted from precessing spin of photon, electron can be considered to be induced from photon. In the vaccum, they can form a system consists of a electron, a positron and a photon. This system interact with neutron and form the atom structure. In this case, a electron that is inside of an atom always form a system with a photon. Loss of this system by photon sphere makes the atom change into dark matter(neutron-cluster) and emits a positron. Double helix trajectory of matter-antimatter pair from photon is related to string theory and a pair of entangled photon can be mediates gravity by being spin 2 itself.

1 Electron-Photon system

1.1 Review of Maxwell's electromagnetic wave model

Maxwell assumed displacement current of virtual varying magnetic flux. I found that the displacement current can be considered as a result from precessing spin of photon. It cause varying magnetic flux and induce displacement current in shape of solenoid cole. There are two additional spin direction in maximum by right-hand rule. Fermions, especially electron and positron, can be generated by satisfying these two direction spin and they move on trajectory in shape of solenoid cole same with displacement current.

1.2 Quantum fluctuation on photon

The photon can probabilistically form a system of electron-positron pair in the vacuum, which is the result from relativistic mass of photon that is variable because of vacuum-energy. It is given by

$$\downarrow e^{+} - b - \uparrow e^{-}$$

where b is the photon. The spin of photon is conserved in 0 and also the charge of photon is conserved in 0 with separated negative charge and positive charge, too. However, the electron-positron pair is maintained very short time because vacuum-energy vary relativistic mass of photon a lot.

2 Photon-exchanging mechanism

For the bound neutrons, there are two possible mechanism of forming or disrupting atom structure. Mechanism of disrupting atom structure can be caused when the atom pass into photon sphere. All mechanism satisfying all of conservation law and b is the photon.

2.1 Mechanism of beta$^-$ decay and D$_p$ decay

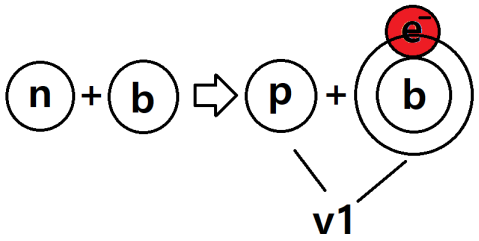

Figure 1: beta$^-$ decay/forming

Mechanism of forming atom structure is given by

$$n^0 \longrightarrow p^+ + e^- + \nu_1 \ [1]$$

where ν_1 is the neutrino stored in atom until it decay. And for the energy conservation, energy of a neutron is given by

$$E_n = E_{p+e+\nu_1} \cdots f.$$

This negative beta decay appears to be a natural decay of neutron without special conditions, as if a single neutron emits electron to the surrounding photon and forms a hydrogen atom.

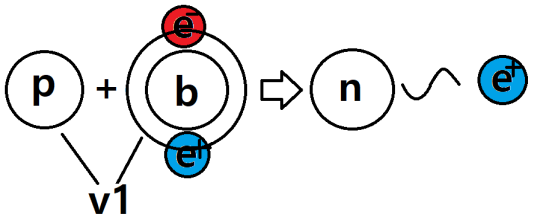

Figure 2: D_p decay/disrupting

D_p decay generally explains the case where the electron-photon pair in the atom is lost by the photon sphere. Thus, the b + (e-) system in figure 1 disappears in figure 2.

Mechanism of disrupting atom structure is given by

$$p^+ + \nu_2 \longrightarrow n^0 + e^+$$

where ν_2 is 1.02 mev + ν_1 because of f. $E_{1.02mev}$ from $\downarrow e^+ - b - \uparrow e^-$ and E_{ν_1} from a stored neutrino make possible of a proton turn into a neutron and a positron.

2.2 Mechanism of D_n decay and D_p decay

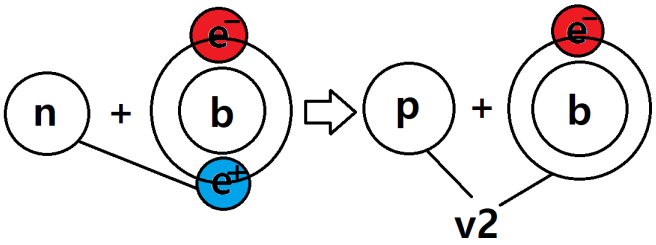

Figure 3: D_n decay/forming

Mechanism of forming atom structure is given by

$$n^0 + e^+ \longrightarrow p^+ + \nu_2$$

where ν_2 is the neutrino stored in atom until it decay.

D_n decay occurs as a neutron and a positron are combined into a proton where the positron is from $\downarrow e^+ - b - \uparrow e^-$ near neutron, and only electron remain with photon. In case of neutron-cluster, atom can be formed by this mechanism.

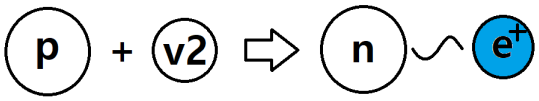

Figure 4: D_p decay/disrupting

Mechanism of disrupting atom structure is given by

$$p^+ + \nu_2 \longrightarrow n^0 + e^+.$$

E_{ν_2} from a stored neutrino make possible of a proton turn into a neutron and a positron.

This is the same D_p decay as in figure 2, except that in this case, the mechanism of atomic structure formation is assumed to be the D_n decay, not the negative beta decay, so it can cause decay itself without $\downarrow e^+ - b- \uparrow e^-$. But this decay - a phenomenon in which a proton decay itself in a short time - must not be observed, since this decay is observed only when the atom loses the EP system by the photon sphere and falls into the black hole. This self-decay is also likely to be misinterpreted as a proton decay whenever it receives energy, but in fact it requires conditions such as lost capacity of covalent bond due to the loss of all EP system, and severe charge instability.

3 Distribution of dark matter

Suppose that the big-bang emerged from the singularity of black hole and additional singularities inside of black hole made present huge galaxies. Define S_o as a black hole which is origin of our universe. A lot of mass pass into S_o are dense at a certain point and generate a singularity. Surrounding masses cause photon-exchanging mechanism by passing photon sphere and lose their electromagnetic interaction ability in atom scale because they turn into bound neutrons for stablity.

The light of 511 kev coming from the center of our galaxy is known to originated from the positron emitted by dark matter[2]. This positron originated from D_p decay. And the distributional relationship between the black hole in the center of the galaxy and surrounding dark matters originated from the singularity of S_o and surrounding masses.

3.1 Problems related to S_o

The phenomenon that galaxies have roughly the same direction of motion for a large scale[3], so-called dark flow is explained by think of S_o as a rotating black hole and also the generating mechanism of supermassive black hole at the beginning of the universe is explained by think of them as singularities of S_o. They were made before big-bang.

The recently discovered non-dark matter galaxy is known to be a loose combination of gas and dust containing a few stars rather than a typical spiral galaxy[4]. This galaxy is not the galaxy which is resulted from the singularity of original field. There was no photon sphere and no D_p decay so there are little dark matter.
The quasar is highly related to the dense region of dark matter[5]. It can be explained by think of quasar as a black hole in S_o. Since dark matter originated from the mass of S_o, the size of black hole and the amount of dark matter are generally proportional.
The asymmetry of matter-antimatter can be explained by the biased matter of S_o. Actually it can be explainded by CP violation but asymmetry caculated from CP violation is not enough to real asymmetry[6]. Bias of S_o can fill the deficiency of that.

3.2 Black hole emits electron

Some of materials that enter the black hole lose their photons by the photon sphere. Photon that has a certain amount of orbital angular momentum form a stable BF system, and it causes the horizon-shaped electromagnetic force. When the photon escapes from the photon sphere, electron belonging to a system escape together. From the viewpoint of outside, electron appear to be emitted from a black hole. Also possibility of seperating a pair of electron-positron of EP system can be considered.

4 Entangled a pair of photon in atom orbit

$\downarrow e^- - b - \uparrow e^-$ cannot be coexist with D_n decay because D_n need for interact of a neutron-a positron where the positron is of $\downarrow e^+ - b - \uparrow e^-$. In other word, $\downarrow e^- - b - \uparrow e^-$ demands $\downarrow e^- - b$ and $\uparrow e^- - b$ so there are two photons inconsistent with $\downarrow e^- - b - \uparrow e^-$. And also in case of mechanism to double electron orbit, there are two remained systems of a photon-a electron and they must have different spin by pauli exclusion principle that are given by

$$\downarrow e^- - b \text{ and } \uparrow e^- - b.$$

However, a pair of EP systems can be considered as $\downarrow e^- - b - \uparrow e^-$ according to below explication.

The spin of electron induced by photon seemed to be non-satisfying case of the spin-conservation law,

$$1 \longrightarrow 1 + (\tfrac{1}{2}).$$

As the spin-conservation law must be satisfied, $\downarrow e^- - b$ and $\uparrow e^- - b$ have to be entangled with

$$1 + 1 \longrightarrow 1 + (\tfrac{1}{2}) + 1 - (\tfrac{1}{2}).$$

Their circular polarization are different because of their different electron-spin. These entangled photons are considered as a system, and its spin is 0.

In case of the higgs boson decay into a pair of photon is given by

$$H_0 \longrightarrow \gamma\gamma' \text{ [7]}$$

where γ and γ' have different circular polarization. The spin conserved in 0 by divided trait. These coupled photons can be considered as a photon that has double circular polarization.

In fact, the conservation of spin angular momentum is also explained by the mechanism in chapter 2 with seperated spin of $\downarrow e^+ - b - \uparrow e^-$. But in here, those mechanism were ignored and the spin conservation have be described at the point of view that the photon appeared to be induce electron itself.

4.1 Orbit condition of Electron-Photon system

The coupled EP system must be met for certain condition. In order to overcome the electrical repulsion between two electrons, the momentum of photon is needed. To maintain stable system constantly like in case of atom, the momentum of photon has to fixed by taking fixed orbit. Then EP system acts like a cooper-pair[8]. Thus, the EP system in atomic orbit acts like superfluid and it does not fall to atomic nucleus.

However, the fixed orbit means the orbit of EP system center, the photon, not of the electron. Of course, depending on the double helix structure of electrons, the center of EP system can vibrate. In short, the definition of fixed orbit is close to the state that the momentum of photon is regularly adjusted to correspond force of the electrical repulsive force of two electrons.

4.2 Double helix structure

The cross-section of coupled EP system is represented as the string (shape 8) that is orginated from double helix of a pair of electron belonging to coupled EP system, and the tension T (= cohesion of system) between the strings (shape S) is given by

$$\frac{\sin^4(x)}{r^2\cos(2x)} \text{[9]}$$

for the angle x = (a half of string angle). If a particle scattered by EP system, there can be two scattering cases; rutherford scattering and compton scattering.

Suppose that scattering phase is fixed to phase of electron-pair in case of angle x(three lattice points in shape of 8). Uniform angles for [rutherford scattering $= \frac{1}{\sin^4(\frac{a}{2})}$] and [compton scattering = $\cos(b)$] to cross-section of EP system. Then the ratio is given by

$$\frac{1}{\sin^4(x)} : \cos(2x).$$

The shape of string depends on just the angle x and the stand-off distance r[10]. Thus, it can be considered that the cohesion of string depends on its angle and its stand-off distance, too. Regard A and B as angular converters of EP system where A is the system in case of rutherford scattering and B is the system in case of compton scattering. For the cohesion, $T \propto \frac{AB}{r^2}$ because it is a force against to electron's electronical repulsion force. Rutherford scattering and compton scattering are processes of opposite viewpoint to EP system. So set them reciprocal of angular converter to EP system. Then the cohesion of system is given by

$$T \propto \frac{\sin^4(x)}{r^2 \cos(2x)}$$

which is similar to double helix structure. Actually it is not about the string that of string theory but the string structure of EP system vibrate because of vaccum-energy unless it is inside of atomic orbit.

5 Conclusion

The past candidates of dark matter(black hole, neutron star, or normal material)are also considered, but the quantities we know of them are inferior to the gravity of dark matter. However, when we apply the hypothesis that our universe is resulted from the black hole singularity, when the big-bang occurs, we start to feel the gravity of masses that originally existed in the black hole and those are irrelevant with after-big-bang material quantities. These masses become neutron-cluster by D_p decay passing through photon sphere and surround the black hole which is the center of galaxy in future. According to this, it is explained that why the distribution area of dark matter is connected to the black hole at the center of galaxy, why it cannot be observed, and why it emit positron[2].

Single neutron decay easily when it in a non-clustered state. On the other hand, there are possiblities of stable neutron-cluster. Unfortunately, there are no confirmed data of neutron bundle but the tetraneutron[11] is presumed to be one of those possiblities.

It is difficult to detect neutron-cluster through D_p decay because it requires the state of all electrons in atom are lost by photon sphere and only a nucleus remains. However, once we have succeeded in detecting neutron-cluster in other ways, we could know whether it is stable or decay into other candidate particles.

6 Relationship with string theory

As a Higgs decay, a photon-pair can be generated. In vaccum, a photon-pair can forms every fermion-pair(of elementary paticle) unless it breaks conservation law, such as $\downarrow e^+ - b- \uparrow e^-$. The cross-section of this double helix path is in the shape of a string. String structure depends on invariant mass of induced fermion-pair and the frequency of vibrating are proportional to vaccum-energy unless the invariant mass is 0. Photon is non-vibrating string because its invariant mass is 0. Thus, photon can be a string shape of straight line. With the idea of string trajectory, we get conclusion that photon go straight.

Suppose that the photon's relativistic mass is transferred to the invariant mass of the fermion-pair when it exceeds the threshold mass. This changes the length and angle of the string to reset satellite orbit. As the vibration of the string depends only on the invariant mass, the derived fermion pair has a unique string structure. If we say that for a photon-pair it acts as a total spin 2 by certain combination, it meets all conditions of the gravition and mediates gravity. As the particles are unable to stop completely, the photon must have relativistic mass. When this relativistic mass exceeds the threshold mass, relativistic mass is transferred to invariant mass of a pair of fermion. In other word, the photon-pair in case of spin 2 always mediates relativistic mass and invariant mass by mediates them as a gravition itself. I am not sure of hidden dimensions of string theory but it can be 2-spin 3-color 2-charge or something else.

7 References

[1] Konya, J.; Nagy, N. M. (2012). Nuclear and Radio-chemistry. Elsevier. pp. 7475. ISBN 978-0-12-391487-3.
[2] P. Jean, J. Kndlseder, V. Lonjou, M. Allain and J.-P. Roques et al., Astron. Astrophys. 407, L55 (2003).
[3] A. Kashlinsky; F. Atrio-Barandela; D. Kocevski; H. Ebeling (2008). A measurement of large-scale peculiar velocities of clusters of galaxies: results and cosmological implications.Astrophys. J. 686 (2): 4952. Bibcode:2008ApJ...686L..49K. arXiv:0809.3734. doi:10.1086/592947
[4] Van Dokkum, Pieter; Danieli, Shany; Cohen, Yotam; Merritt, Allison; Romanowsky, Aaron J; Abraham, Roberto; Brodie, Jean; Conroy, Charlie; Lokhorst, Deborah; Mowla, Lamiya; o'Sullivan, Ewan; Zhang, Jielai (2018). "A galaxy lacking dark matter". Nature. 555 (7698): 629. arXiv:1803.10237Freely accessible. Bibcode:2018Natur.555..629V. doi:10.1038/nature25767. PMID 29595770
[5] http://classic.sdss.org/news/releases/20070209.quasar.html
[6] The LHCb collaboration(2017). "Measurement of matterantimatter differences in beauty baryon decays", p. 1, DOI: 10.1038/NPHYS4021
[7] Particle Data Group. H0 decay width. 2014 Review of Particle Physics.
[8]Cooper, Leon N. (1956). "Bound electron pairs in a degenerate Fermi gas". Physical Review. 104 (4): 11891190. Bibcode:1956PhRv..104.1189C
[9]Zeyad Al-Zhour, Amin A. Aqel, Abdallah Ibrahim(2008). "Mathematical properties of DNA structure in 3-dimensional space", section 2, p. 7(220)
[10]Zeyad Al-Zhour, Amin A. Aqel, Abdallah Ibrahim(2008). "Mathematical properties of DNA structure in 3-dimensional space", section 2, p. 3(216)
[11]Bertulani, C. A.; Zelevinsky, V. G. (2003). Tetraneutron as a dineutron-dineutron molecule. Journal of Physics G 29 (10): 24312437. Bibcode:2003JPhG...29.2431B. arXiv:nucl-th/0212060. doi:10.1088/0954-3899/29/10/309.