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Proposal of the Electromagnetic Structures of the Most Important Particles from Decays

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Review Article

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ABSTRACT

Recently, it was published the book “Electromagnetic Unification of Four Forces” (ISBN978-3-659-76798-2), compiling the progressions in physics made by the world people, manifested in television while led notably by me and the Members in the world satellite networks from India, Zhejiang and USA. It was achieved many important progressions, such as the spatially localized electromagnetic mass structure; the electromagnetic multi-hairy structure; the electromagnetic orienting force; the thermodynamic strong force from electromagnetic multi-hairy hybrid; the weak processes from hybrid split; the gravitational force as electromagnetic curving and shifting red from electromagnetic orienting force; and so on; electromagnetic unifying the four forces. It was also determined the structures of photon, positron/electron, π mesons, μ leptons and neutrinos. In this article, from these achievements and decay products, it is attempted to further propose the electromagnetic structures of particles most important in physics, with conservation of energy (mass), charge and spin. It is classified the combined baryons into those based on proton such as the proton, neutron, Λ0 baryon, ∑ baryons, and Ξ baryons; those based on kaons from colliding pieces such as the kaons, η baryons, charm quarks, and bottom quarks; those containing the W/Z bosons with the wavelength equivalent to hybrid interval, such as the W/Z/Higgs bosons and top quarks. Besides, it is pointed out that the τ neutrino can adjust the angle between the adjacent hybrid areas in natural atomic nucleus. For the convenience of physicists to refer to, it is listed these electromagnetic structures into tables.

INTRODUCTION

Since October in 2005, it has been efforts of the world people, manifested in television and led notably by me, the India Member, Zhejiang Member, and US Members in the world satellite networks, to attempt to realize electromagnetic unification of four forces. In 2009 I finished writing a book on the major progressions made by them up to then, and in 2015 I published this book entitled as “Electromagnetic Unification of Four Forces”(ISBN978-3-659-76798-2) [1,2].

Besides, in the book it was also determined the most important structures of photon, positron/electron, π meson, μ lepton and neutrino, whereas with the structures of other important particles left undetermined yet, such as the proton, neutron, most quarks, τ-lepton and τ neutrino, W/Z/Higgs bosons, gluon and so on. In this article, based mostly on the achievements made in the book, especially the electromagnetic multiple hairy structure and hybrid proposed by the satellite member from India beyond the consideration of present quark model, it is attempted to further propose the electromagnetic structures of these other important particles from their decays.

BRIEF REVIEW OF MILESTONE BOOK: ELECTROMAGNETIC UNIFICATION OF FOUR FORCES

The Non-Relativity of Ideal Time and Space

In the book, it was demonstrated the non-relativity of ideal time and space in the first chapter [3]. As proposal, the ideal reference system O was stationary, the ideal reference system A and B moved at constant velocity v and –v respectively. From the reference system O to see A, the relative velocity was v. If the axial unit of time itself possessed relativity, its relative time changed t. From the reference system O to see B, the relative velocity was -v, and its relative time also changed t. In this regard, the two axial units of time of reference system A and B were equal and the same. Again from the reference system B to see A, the relative velocity of reference system A was 2v, while the change in relative time was close to 2t, different from the situation observed from the reference system O. These two states were concurrent but contradictory. The only explanation was that the difference in value for these axial units of time t=0. With the same method, it could likely be deduced that the value of difference for the axial units of space x=0. It was necessary to solve these contradictions and paradoxes with the conclusion that there was no relativity in time and space [3].

In consistency, recently, it was demonstrated in updated experiments that the speed of neutrino was at least equal to that of light [4]. In consideration of that the neutrino possessed the mass, the result was unfavorable to the rationality of special relativity, while in further supported the non-relativity of ideal time and space.

The Electromagnetic Mass, Multi-Hairy Structure and Orienting Force

In the book, there were moreover introduced some novel electromagnetic structural forms and an important type of force, which were the keys to achieve the significant progressions, as followings:

(1) The author and European people in television proposed that the mass of particle should possess the spatially localized electromagnetic structure from the fact that the γ photon of high energy could transform in reciprocation with the gravitational mass [5]. The mass electrical field and magnetic field of particle moved continuously and transformed reciprocally, but spatially this electromagnetic mass structure did not resemble that of photon which dissipated away. Instead it returned to the vicinity around its original point of departure through its electromagnetic movement and transformation [5]. Besides, the increase in mass during quark condensation [6,7] strongly supported the mass as spatially localized electromagnetic structure, with mass increment to be easily explained by electromagnetic conformational change [5]. After Zi-Jian Cai led the sate-commune group to make this proposition in early October 2005, the activities in discussion and exchange of physics elicited the attention, comment and participation of people in the whole world with television as the common media.

(2) The Sate-Commune Group India Member and athletes in video record of 2000 Olympic Opening Ceremony both proposed the electromagnetic multiple hairy structures [8]. This structure and hybrid was beyond the consideration of the present quark model. In a photon when a changing electrical vector E generated a changing magnetic vector B, immediately from such new and changing magnetic vector B there generated the next changing electrical vector E. At this time, the original electrical vector E had changed a little. Such process repeated continuously until the earliest changing electrical vector E vanished. In this way, there would generate the electromagnetic multi-hairy structure for the photon [8]. In similarity, there would also generate the multi-hairy electrical fields for both positron and electron [9]. It was easy to see that the positron and electron could hybrid like two gears.

(3) The Sate-Commune Group Zhejiang Member proposed the electromagnetic orienting force [10]. When several electromagnetic particles with positive and negative charges were close together, among their electrical fields there would occur the static electrical interactions with the same charge repelling and opposite charge attracting. The same charge repelling made the electrical fields increase in distance, decrease in interactive strength and decrease in interactive time. The opposite charge attracting made the electrical fields decrease in distance, increase in interactive strength and increase in interactive time. Such asymmetrical interactions made them generate a kind of net attractive force among the electromagnetic particles, called as the electromagnetic orienting force [10].

Electromagnetic Unification of Four Forces

In the book, it was utilized the electromagnetic force to unify the strong force, weak force and gravitational force, unifying the four forces [1,2]. In premise, the energy was present as the frequency of electromagnetic wave or frequency of light in physics, thereby all forces with energy should be unified with the electromagnetic force.

(1) With regard to the strong force, it was suggested in the book that there formed the stable electromagnetic multi-hairy hybrid between the adjacent positive and negative quarks, while it was further divided the released energy brought about by the electromagnetic hybrid into two parts [11]. One was the released energy of the electromagnetic multi-hairy hybrid itself. Another was the thermodynamic moving, vibrating and rotating energy of quark particles and their internal electromagnetic structures, which was released by the orderliness and stability of electromagnetic multi-hairy hybrid [11]. Both of the two energies were parts of the energy of strong interaction. The difference of π meson and μ lepton in their nuclear reactivity supported the strong interaction as generated from the electromagnetic multi-hairy hybrid [11].

(2) With regard to the weak process, it was suggested in the book that, as the electromagnetic multi-hairy hybrid of positive and negative quark was subject to the multiple destructions and effects such as the internal tension within atomic nucleus and so on, the hybrid was torn apart and there accordingly occurred the recombination and modification in structure of atomic nucleus. The electromagnetic multi-hairy hybrid torn-apart to single side formed weak pairing and binding with the external electrical field of opposite charge, getting stabilized temporarily [12]. In the subsequent process of weak interactive decay, the external electrical field pairing and binding with the single side of hybrid turned to bind with another external electrical field of opposite charge in external environment, dropping away from its binding with the original single side of hybrid, and becoming the neutrino of oscillatory electrical structure of opposite charge [12].

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With this mechanism of weak process, it was speculated in the book that, if modifying the present quark theory and proposing that the positive and negative π mesons themselves consisted of only one single quark, it was possible to construct the structural model for the positive and negative quark with the weak interactive decays of π meson, that was the positive and negative quark was just the charged π meson made from the respective positron and electron with at least one flat hybrid plane [13]. Quark condensation with increment in mass or frequency supported the explanation as formation of the flat hybrid plane [13].

(3) With regard to the gravitational force, it was suggested in the book that the electromagnetic mass waving entity of gravitational donor interacted in electromagnetic orientation with the electromagnetic waves mediating the gravity, making them turn in curve. While such orienting interaction fading away with the electromagnetic waves partially returning to the original status, the electromagnetic waves consumed energy and shifted red [14]. Both of them manifested in sum as the phenomena of gravitational field [14]. The photon and electromagnetic wave curving and shifting red in gravitational field directly supported this explanation [14]. Besides, the increment of mass during condensation of quarks [6,7] could only be explained with the electromagnetic conformational change of gravitational entity, with higher mass frequency affected more in coordination in gravitational attraction, supporting this mechanism of gravitational force.

SPECIALTIES OF HIGH-ENERGY PARTICLES

Particle Collision in Accelerator or Collider

Many particles of high energy are produced in accelerators or colliders. In this regard, it is important to consider the collision there to generate the particles. (a) It is believed by the world people in television that the particles from collision in accelerators or colliders are simple in electromagnetic conformation as bigger in hybrid area and higher in hybrid frequency [2]. The Brazilian people in television argued that any dented structure of particle, without external force to maintain, would naturally turn into flat plane with higher frequency [2]. (b) It is necessary to point out that collision of two electromagnetic particles in accelerators or collider would result in breaking down the electromagnetic structures of the two particles into many pieces. From these electromagnetic pieces there reconstitute many new particles, with positive pieces hadronizing into positive particles, negative pieces into negative particles, and positive/negative contacting pieces into many combined particles with hybrid regions. This was the reason I argued that, in the observed third jet suggested as the evidence for gluon, there would also have contaminated or coexisted with the electromagnetic hybrid regions altogether [2]. The three jets in observations have actually demonstrated the presence of hybrid regions during hadronization!

The Radiative Decays and Electromagnetic Decay

To determine the electromagnetic structure of particle, the radiative decays and electromagnetic decay of it can provide useful information on the structural constituents of the particle. (a) From the mass frequency of particle, it is possible to determine the frequency of the particle and of the flat hybrid plane in the particle. (b) From the hadronic and weak interactive decays, it is possible to determine whether there is any flat hybrid plane in the particle, as well as the number of constituent particles in the combined particle. The bigger the particles generated in the decays, the more useful to clarify the structure of the combined particle. (c) Sometimes, it is possible that a constituent particle may have more than one flat hybrid planes in the combined particle. From the electromagnetic decay, it is possible to assist determination of the number of electromagnetic hybrids present in the particle.

The Specialty of τ Neutrino and W/Z Bosons

The τ type neutrino is special in that it is the heaviest neutrino in all three types of neutrinos. From the electromagnetic neutrino structure [1,2], the τ type neutrino should also be composed of the oscillatory electrical structure of opposite charge. On the other hand, the τ- lepton decays in many ways [15], with the most common three ways as: (a) τ-⟶π-π0ντ; (b) τ-⟶π-ντ; (c) τ-⟶π-2π0ντ. With the variety in number of π0 mesons generated, it is obvious that the τ- lepton contains a π- meson with more than one flat hybrid planes, while the τ type neutrino possesses one electrical field able to adjust the angle of adjacent hybrid regions in the τ- lepton. Whereas, as τ- lepton may also decay in other minor ways generating more than one π- mesons, it is likely that the τ- lepton may have several subtypes having not been purified yet.

The W/Z bosons possesses very big mass up to more than 80GeV/c2 [16]. It has been suggested by the physicists that the big mass of W/Z bosons corresponds to the short interactive distance of weak interaction [16]. Because in the book the short interactive distance of weak interaction corresponds to the hybrid interval between the positive and negative electromagnetic entities [12,13], it is obvious that the W/Z bosons possess the wavelengths equivalent to that interval. Since usually the W/Z boson forms from proton collision, it is conceivable that the generated W/Z boson of high frequency then turns to lock with the hybrid interval present around in quantity. Due to the impurity of the surrounding hybrids the W/Z boson locks to, the W/Z boson decays in numerous ways [16].

The Conservation of Energy (Mass), Charge and Spin

To deduce the structure of combined particle from its decays to the constituent particles, it is necessary to consider the conservation of energy (mass), charge and spin. It is necessary to point out that, in the book, the conservation of mass, energy,

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charge and spin was maintained in the decays of both π mesons and μ leptons, as well as in the consideration of their electromagnetic structures together with those of electron/positron, neutrinos and photons [12,13]. If the provided decays from a bigger combined particle to them are also conserved in energy (mass), charge and spin, it would be certain that the deduced structure of the particle is as well conserved in mass, energy, charge and spin naturally.

Methods to Propose the Structure of Particle

Herein, it is collected together the methods to propose the structure of particle, as followings: (a) Particles generated in accelerator or collider should result from colliding pieces containing not only single one but also positive/negative bonded ones. Therefore, particles generated in accelerator or collider may often possess several constituents in combination. Especially, if a positive area collides with a negative area, it is possible to generate many pieces of hybrid flats making up a bigger combined flat particle. (b) From the biggest products of radiative decays of particle, it is possible to determine the constituent particles in the combined particle, while from the electromagnetic decays, it is possible to assist determination of the number of electromagnetic hybrids present in the particle. (c) It is necessary to check whether there is any W/Z boson in the products of decay, so as to determine whether the particle contains frequency comparable to or higher than that of W/Z boson. (d) It is necessary to check whether there is any τ type neutrino, so as to determine whether there occurs angular change of adjacent hybrid regions in the particle during decay.

PROPOSAL OF STRUCTURES OF THE MOST IMPORTANT PARTICLES

Due to the huge number in varieties of particles, it is impossible to provide a full description of structures of all kinds of particles. In this regard, in this paper, it is only attempted to deduce the structures of some particles most important in physics. Besides, due to the incompleteness in reliable data available for decays of some high-energy particles, it is also necessary to further improve and rectify the structures listed herein in future.

Photon, Positron/Electron, π Meson, μ Lepton, Neutrino and τ- Lepton

In the book "Electromagnetic Unification of Four Forces" (ISBN978-3-659-76798-2), the world people worked out the electromagnetic structures for these important particles except the τ- lepton. Besides, in the book, the conservation of mass, energy, charge and spin was maintained in decay of both π mesons and μ leptons to the electron/positron, neutrinos and photons [12,13]. Therefore, if the decays from a bigger combined particle to these particles are also conserved in energy (mass), charge and spin, it would be certain that the deduced structure of bigger combined particle is also conserved in energy (mass), charge and spin naturally.

(1) Photons: It was pointed out in the book that the photon would possess the electromagnetic multi-hairy structure, because the newly generated magnetic field from the changing electrical field would immediately generate another new electrical field for the photon [8].

(2) Electron/positron: It was pointed out in the book that the electron/positron resembled the photon in having the electromagnetic multi-hairy rotational structures, while with their electrical lines substituting the hairy electrical field of photon [9].

(3) π mesons: It was pointed out in the book that, as the charged π mesons able to participate in strong interaction, and also able to decay to the respective positron and electron while giving out neutrinos [17], it was suggested that the charged π mesons were just the respective positron and electron with at least one flat hybrid plane of higher frequency [2,13], while the π0 might just be the dropped hybrid region [2,13].

(4) μ leptons: It was pointed out in the book that, as the μ leptons were unable to participate in strong interaction while it was decayed from the π mesons, they were similarly the respective positron and electron with one plane of higher frequency [2,13].

(5) Neutrinos: It was pointed out in the book that the neutrinos possessed the oscillatory electrical structure of opposite charge [2,12,13]. Please refer to section 2 for the book review on how these neutrinos were generated in weak interaction.

(6) τ- lepton: It has been mentioned above that the τ- lepton should contain a π- meson with more than one flat hybrid planes, with one electrical field from the τ type neutrino adjusting the angle of adjacent hybrid regions in this lepton. However, since τ- lepton may decay in other minor ways generating more than one π- mesons, it is likely that the τ- lepton may consist of the mixture of unpurified subtypes of leptons of similar characteristics.

In summary, the structures of these particles are listed in **(Table 1).**

Up quark, Down Quark and Strange Quark

The protons and neutrons are both composed of up quark and down quark [18,19]. Up quark and down quark in cluster play the central role in constituting the atomic nucleus [20].

From the ability of up and down quark to participate in strong interaction, as well as the decay of charged π mesons, it was suggested in the book "Electromagnetic Unification of Four Forces" (ISBN978-3-659-76798-2) to revise the quark theory to make one charged π meson contain one quark [13]. In this way, the up/down quark was just simply the respective positron/electron with

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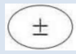
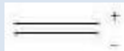
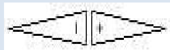
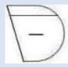
at least one flat hybrid plane of higher frequency [2,13]. The defined charge and mass of them should also be revised accordingly, equivalent to those of corresponding π mesons.

Table1. The structures of photon, positron/electron, π mesons, μ leptons, neutrinos and τ- lepton.

Particles	Mass(MeV/c^2)	Charge	Decays	Structure
photon	0	0	Stable	
electron	0.511	-e	Stable	
positron	0.511	+e	Stable	
μ±leptons	106.6	±e	μ±→e±$v^e v^\mu$	
π±mesons	139.6	±e	π±→μ±v^μ	
π0 mesons	135.0	0	π0→γ	
neutrinos	Sum 0.00032	0	Stable	
τ- leptons	1777	-e	τ-→(a)π-π0v^τ;(b) π-v^τ; (c) π-2π0v^τ; et al.	

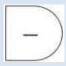
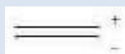
Notes: (a) Mass of neutrinos is the average summed mass of all 3 types of neutrinos. (b) τ- leptons may be unpurified mixtures of similar characteristics, with the charge rectified to that of π meson.

Such revision is supported in three aspects: (a) No free up/down quark has been found in experiments [21]. (b) The European people in television have pointed out that the charge of positron/electron cannot be further divided in experimental observations up to now, and accordingly the charge of respective charged π mesons able to decay to them can neither be divided. In this regard, it is most likely that one charged π meson contain one charged quark without dividing the charge. (c) I have pointed out that the quantum theory of Planck results from the photons emitting from electron possessing the same individual electrical hairy strength as electrical line of electron with frequency to differentiate energy only [2]. As there being only one kind of photon, without differentiation in emission from electron or nuclear quark, it is most likely that the up/down quarks possess the modified structure from positron/electron with flat plane of higher frequency [2], just equivalent to those of corresponding π mesons. (d) According to the quark model, the charged π meson should contain one quark and another anti-quark [13], which should cause annihilation when interacting with atomic nucleus rather than strong reaction [11].

Witnessed by the author, it was even speculated by the European people in television that the color of up/down quark was related to the number of flat planes within one quark. This issue obviously needs further investigation.

The strange quark is present in some strange particles such as kaons (K) [22], Sigma (∑) baryons [23], and so on. As the decays of these particles often involve the generation of π0 particle which can directly decay into γ photons electromagnetically, it is very likely that the decays of these particles through strange quark just represent the deletion of the flat hybrid region. The mass of strange quark at around 100MeV/c2 [24] supports this proposal. In summary, the structures of these particles are listed in **(Table 2)**.

Table 2. The structures of up quark, down quark and strange quark.

Particles	Mass(MeV/c^2)	Charge	Decays	Structure
up quark	139.6	+e	π+→μ+v^μ	
down quark	139.6	-e	π-→μ-v^μ	
strange quark	95±5	0	π0→γ	

Notes: The mass and charge of up and down quark are both rectified equivalent to π ± mesons.

Proton, Neutron, and the Λ, ∑, Ξ Baryons

From the products of decays, it is possible to construct the structure of combined particles. Herein, it is deduced the structures of the important combined particles related to proton, including the proton, neutron, and the Λ, ∑, Ξ baryons. Whereas, the Δ baryons are too short in life times to be listed herein.

(1) Proton: Proton has been assayed to contain sub-particles [18]. With the revision of up/down quarks into the corresponding charged π mesons, it is easy to propose that the proton is composed of five quarks making hybrid in linear chain, with two flat

electrons while three flat positrons. One positron locates at one end while another positron at another end. Between every adjacent positron and electron there forms the flat hybrid, transforming them into the corresponding charged π mesons or up/down quarks. As the frequency at the hybrid region is much higher than that of electron/positron, the charged π mesons acquire mass via transformational formation of flat hybrid region called as quark condensation [2,13], up to about 120MeV/c2 for each flat area of quark. In this regard, the summed mass of proton from these π mesons should be about 960MeV/c2. The mass of proton has been assayed as about 938MeV/c2 [25].

(2) Neutron: Neutron has been assayed to also contain sub-particles [19]. It can decay as [26]: (a) n0→p+e-ve; (b) n0→p+e-veγ, and has the mass at about 939MeV/c2 [26], a little heavier than that of proton. In this regard, the neutron should have the same structure of five quarks as proton. Whereas, an additional electron makes tight electrical interaction rather than flat hybrid with the two positrons on the two ends, forming a hexagonal plane, while increasing the mass a little.

(3) The Λ0 baryon: The light Λ0 baryon decays in two modes [27]: (a) Λ0→p+π-; (b) Λ0→nπ0. Herein, it is proposed that the light Λ0 baryon mainly possesses the structure of proton containing five quarks linearly alternating in charge. In addition, an extra electron forms flat hybrid with one positive quark at one end, while makes tight electrical interaction with the positive quark at another end, also forming a hexagonal plane. In the decay mode (a), the extra electron drops from its flat hybrid and becomes the π- meson, while the rest part of Λ0 baryon becomes the proton. In the decay mode (b), the flat hybrid of the extra flat electron drops out and becomes the π0 meson, while the rest parts of both Λ0 baryon and extra electron combine electrically, and become the hexagonal neutron.

(4) The ∑+, ∑- and ∑0 baryons: The ∑+ baryon decays in two modes [28]: (a) ∑+→nπ+; (b) ∑+→p+π0. From these decay modes, it is herein proposed that ∑+ is composed of a hexagonal neutron with an extra positron forming flat hybrid with one flat electron in the hexagonal plane. In the decay mode (a), this extra flat positron drops from its flat hybrid and becomes the π+ meson, while the rest part of ∑+ baryon becomes the hexagonal neutron. In the decay mode (b), the flat positron within the hexagonal plane making electrical interaction with electron while being adjacent to the positron beyond the hexagonal plane drops out due to releasing the hybrid region as π0 meson, causing annihilation of the electron with the dropped positron, while the rest part of ∑+ baryon becomes the proton.

The ∑- baryon mainly decays as [28]: ∑-→nπ-. From such decay, it is proposed that ∑- is composed of a hexagonal neutron. Whereas in the ∑- baryon, another extra electron forms the flat hybrid with the positron on the other end of hexagonal neutron. During the decay, this extra flat electron drops from its flat hybrid and becomes the π- meson, while the rest part of ∑- baryon becomes the neutron.

The ∑0 baryon mainly decays as [29]: ∑0→Λ0γ. From such decay, it is proposed that ∑0 baryon is composed of a proton containing five quarks linearly alternating in charge. In addition, an extra electron forms flat hybrid with one positive quark at one end. When this extra flat electron makes tight electrical interaction with the positive quark at another end, there forms a hexagonal Λ0 baryon and gives out the electromagnetic energy as photon.

(5) The Ξ- and Ξ0 baryons: The Ξ- baryon mainly decays as [30]: Ξ-→Λ0π-. From such decay, and as the Λ0 baryon possesses the hexagonal structure, it is proposed that the Ξ- baryon possesses the hexagonal structure of a Λ0 baryon with another extra electron making flat hybrid with the positron on the other end of the hexagonal Λ0. During the decay, this extra flat electron beyond the hexagonal Λ0 drops from its flat hybrid and becomes the π- meson, while the rest part of - baryon becomes the hexagonal Λ0 baryon.

The Ξ0 baryon mainly decays as [30]: Ξ0→Λ0π0. From such decay, it is proposed that the Ξ0 baryon possesses the hexagonal structure with all adjacent quarks making flat hybrid with each other. During the decay, one of the flat hybrid drops out and becomes the π0 meson, while the rest part of Ξ0 baryon becomes the hexagonal Λ0 baryon.

In summary, the structures of these particles are listed in **(Table 3)**.

The K, η baryons, the Gluon Boson, and the Charm and Bottom Quarks

There are other types of baryons very unstable, including the K, η baryons and so on, as well as the charm and bottom quarks. They decay quickly through kaon-related structure in various modes, including 2π/3π distinct modes often containing π0 products.

(1) The K+, K- and K0 baryons: K0→2π and K0→3π are two major distinct weak decays for kaons [31]. Regardless of the charge of kaons, most of them undergo various decays, and they obviously contain the mixture of unpurified colliding subtypes of baryons of similar characteristics. Due to this reason, it is useful to work out the structures of kaons smallest or simplest in constituents here as typical example, while leaving the more complex structures of bigger kaons determined upon usage.

The K+ baryon decays in the simplest way as [32]: K+→π+π0. From such decay, it is proposed here that the simplest K+ baryon is a positron with two flat hybrid regions with one of them in hybrid status. During the decay, the flat hybrid drops out and becomes the π0 meson, while the rest part of K+ baryon becomes the π+ meson. Likewise, the simplest K- baryon is an electron with two flat hybrid region with one of them in hybrid status.

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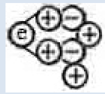
Table 3. The structures of proton, neutron, and the Λ, ∑, Ξ baryons.

Particles	Mass(MeV/c^2)	Charge	Decays	Structure
Proton	938.3	+e	Stable	
Neutron	939.6	0	n0→(a)p+e-v^e; (b)p+e-v^eγ	
Λ0 baryon	1115.6	0	Λ0→(a)p+π-; (b)nπ0	
∑+ baryon	1189.4	+e	∑+→(a)nπ+; (b)p+π0	
∑- baryon	1197.3	-e	∑-→nπ-	
∑0 baryon	1192.5	0	∑0→Λ0γ	
Ξ- baryon	1321.2	-e	Ξ-→Λ0π-	
Ξ0 baryon	1314.7	0	Ξ0→Λ0π0	

Notes: (a) Touching balls are the multiple hairy hybrid of positive and negative quarks by flat plane. (b)Ball line is the intimate electrical interaction between the electron and positive quark.

The K0 baryon decays in two simplest ways as K0→2π and K0→3π [31], with many variations. From the decays, it is proposed here that the simplest K0 baryon is a pair of positron and electron colliding together into two flat disks with two to three flat hybrid regions. During the decay, one or two of the flat hybrid regions drop out and becomes the one or two π0 mesons, while the rest pair of flat positron/electron of K0 baryon becomes the last π0 meson.

(2) The η baryons: Regardless of the charge, the η baryons undergo various decays, and manifest the mixture of unpurified colliding subtypes of baryons of similar characteristics. η→3π0 and η→π0π+π- are the most typical decay modes [33,34]. From such decays, it is proposed here that the simplest η baryon is a pair of positron and electron colliding together into two flat disks with at least three flat hybrid regions. During the decay, one or two of the flat hybrid regions drop out and become the one or two π0 mesons, while the rest part of η baryon becomes π+π- or 2π0.

(3) The gluon boson (g±): The theoretical gluon (g±) is 0 in mass, 1 in spin, and 0 or e in charge [35,36]. Therefore, it is likely that the theoretical gluon (g±) may resemble half neutrino. The observed gluons in three-jet event was very high in energy to hadronize into particles [36], so that it would be argued that the observed gluons would also have contaminated or coexisted together with the electromagnetic hybrid regions in the third jet, same in behavior for both in the collider [2].

It is obvious that the formulated structure for gluon (g±) is unsatisfactory. It is necessary to revise the basic characters of gluon (g±) to work out its satisfactory structure. Mass as 0 for gluon (g±) is most likely to require rectification.

(4) The charm quarks: The charm quarks undergo various decays, and manifest the mixture of unpurified colliding subtypes of baryons of similar characteristics. D0 meson is the lightest particle containing one charm quark and must decay via the charm quark. D0→K-π0π+ and D0→K-π+π+π- are the most typical decay modes [37]. From such decays, it is proposed here that the simplest charm quark is a pair of positron and electron colliding together and breaking down into three flat disks with two flat disks of identical charge making totally at least six hybrids with one flat disk of opposite charge, relatively stable. During the decay of D0 meson, one or two of the flat disks drop out from hybrid and become the one or two charged π+ mesons, while the rest part of charm quark baryon becomes the K- baryon.

(5) The bottom quarks: The bottom quarks undergo various decays, and manifest the mixture of unpurified colliding subtypes of baryons of similar characteristics. The bottom quark (b) may decay into the charm quark (c) in the typical way as [38]: b→clvl. From such decay, it is proposed here that the bottom quark is a pair of positron and electron colliding together and breaking down into three flat disks with two flat disks of identical charge making hybrid with one flat disk of opposite charge. In addition, the other sides opposite to the colliding flats of these three pieces are also in further pushed all the way to the colliding flats, and therefore form other two layers of flats of hybrid. During the decay of bottom quark, one or two of the flat disks drop out from the hybrid and become the leptons, while the rest part of bottom quark becomes the charm quark.

In summary, the structures of these particles are listed in **(Table 4)**.

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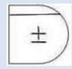
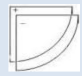
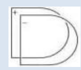
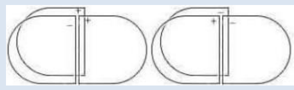
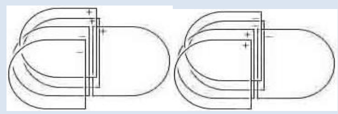
Table 4. The structures of the K, η baryons, the gluon, and the charm and bottom quarks.

Particles	Mass(MeV/c^2)	Charge	Decays	Structure
K±baryons	493.8	±e	K±→π±π0	
K0 baryon	497.8	0	K0→(a)2π; (b)3π; et al.	
η baryon	548.8	0	η→(a)3π0; (b)π0π+π-; et al.	
gluon(g±)	almost 0	0 or ±e	hadronization	
charm quark±	1275	±e	D0→(a)K-π0π+; (b)K-π+π+π-; et al.	
bottom quark±	4180	±e	b±→c±lv; et al.	

Notes: (a) Most of these particles represent unpurified colliding mixtures of similar characteristics. (b) The charges of charm quark and bottom quark are both rectified equivalent to π± mesons.

The W/Z/Higgs Bosons and the Top Quark

(1) The W/Z bosons: The W/Z bosons are both big in mass of more than 80GeV/c2 [16]. It has been suggested by the physicists that the big mass of W/Z bosons corresponds to the short interactive distance of weak interaction [16], so that it is obvious that the W/Z bosons have the wavelengths equivalent to the hybrid interval between the positive and negative electromagnetic entities [12,13].

W±boson is able to lock to the hybrid interval present in quantity around during proton collision. Due to the impurity of the surrounding hybrids the W boson locks to, the W boson may decay in numerous ways [39]. W±→c+b- and W±→b+b- are the two typical decay modes generating heavy quarks [39]. From such decays and the special frequency of W±boson, it is proposed here that the W±boson is a pair of positron and electron colliding together and breaking down into 2-3 flat disks making hybrid not only using colliding flats but also using the other sides opposite to the colliding flats pushed all the way to the colliding flats. In addition, a small piece of fragment is bumped out during collision, acquiring the very high frequency to locks to the hybrid interval of the piled flat disks. During the decay of W±boson, the high frequency piece drops out, while the rest part of W±boson may become the bottom quark or charm quark.

Z boson is also able to lock to the hybrid interval as the W±boson, and is a little bigger in mass than the W±boson [16]. In analogy to the W±boson, the Z boson may also decay in numerous ways into quarks [16]. Because the Z boson is neutral in charge, it is proposed here that, in the Z boson, there is a pair of very high frequency pieces forming hybrid with wavelength matching to the hybrid interval, with the rest part of Z boson resembling the W±boson made from the bottom quark or charm quark.

(2) The Higgs boson: It is the premise for a Higgs boson to be able to decay into WW or ZZ bosons [40]. From such decays, it is proposed here that the Higgs boson possesses its core structure as the hybrid of a pair of colliding pieces at high frequency of W/Z boson into not only two flats on the two colliding planes, but also other two flats pushed from the planes opposite to the colliding planes. The rest part of structure of lower frequency of the Higgs boson resembles that of W/Z bosons.

(3) The top quark: The top quark is the only quark able to decay into the W±boson and possesses the high frequency as the W±boson [41]. From such decay, it is proposed here that the top quark is composed of a W±boson with high frequency locking to the hybrid interval in hybrid region of a bottom or charm quark.

In summary, the structures of these particles are listed in **(Table 5)**.

DISCUSSION AND CLASSIFICATION

From the many particle structures worked out in this paper, ranging from the most basic particles such as electron, neutrino to the huge colliding particles such as Higgs boson, it is possible to classify their structures into four types.

(1) The simple stable structure: Many basic and common particles have this type of structure, which are different from each other. Among them, there are the electromagnetic multiple hairy structure of photon, the multiple electrical hairy structure of positron and electron, the oscillatory electrical structure of neutrino, the up/down quark as the respective positron/electron with at least one flat hybrid plane of higher frequency.

(2) The combined structure based on linear proton and hexagonal neutron: Many combined particles possess this structure

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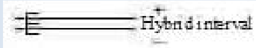
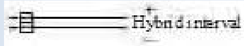
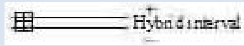
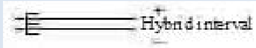
with proton of five quarks in linear structure or neutron with hexagonal plane. Among them, there are the proton, the neutron, the Λ0 baryon, the ∑ baryons, and the Ξ baryons. The Δ baryons are too short in life times to be listed.

Table 5. The structures of the W/Z/Higgs bosons and the top quark.

Particles	Mass(MeV/c²)	Charge	Decays	Structure
W±bosons	80385	±e	W±⟶(a)c+b-; (b)b+b-; et al.	
Z boson	91188	0	Z⟶(a)c+b-; (b)b+b-; et al.	
Higgs boson	125090	0	Higgs⟶(a)W+W-; (b)ZZ; et al	
top quarks±	173210	±e	t±⟶(a)W±c±; (b)W±b±; et al.	

Notes: (a) These structural drawings only show the high frequency piece locking to the hybrid interval, with the rest parts unshown. (b) Each particle represents unpurified colliding mixture of similar characteristics. (c) The charges of top quarks are rectified equivalent to π± mesons.

(3) The combined structure based on kaons: Many unstable combined particles possess the structure with K baryons from colliding pieces of various sizes and characteristics as the major constituents. Among them, there are the kaons, the η baryons, the charm quarks, and the bottom quarks.

It is necessary to note that some particles from proton collision, such as Ω- baryon, can decay into both proton-type baryon and K-type baryon, as Ω-⟶ΛK-⟶(pπ-)K- [42]. Their structures can similarly be worked out upon usage as others in the text, while they are certainly also unpurified colliding mixture of similar characteristics.

(4) The combined structure of high frequency containing W/Z bosons: Some unstable combined particles from high-energy collision possess the very high frequency as that of W/Z bosons, whose wavelength can match to the hybrid interval of two particles of opposite charge. Among them, there are the W/Z bosons, the Higgs boson, and the top quarks.

CONCLUSIONS

In conclusion, based on the achievements made by the world people and the simple stable electromagnetic structures compiled in the book "Electromagnetic Unification of Four Forces"(ISBN978-3-659-76798-2) as the photon, positron/electron, neutrino, and π mesons, in this article it is attempted to further propose the electromagnetic structures of particles not yet illustrated in the book while important in physics, including the up quark, down quark, strange quark, and τ- leptons; the combined baryons based on linear proton and hexagonal neutron such as the proton, neutron, Λ0 baryon, ∑ baryons, and Ξ baryons; the combined structures based on kaons from colliding pieces of various sizes and characteristics such as the kaons, η baryons, charm quarks, and bottom quarks; the combined structures from colliding pieces of high frequency containing W/Z bosons, such as the W/Z bosons, Higgs boson, and top quarks. The theoretical massless gluon may resemble half neutrino, but may require rectification for its zero at mass. All of these electromagnetic structures are constructed from their decay products while making use of the electromagnetic multiple hairy structure/hybrid beyond the consideration of present quark model, so that are all novel to the society of physics. All of these structural results are listed into tables convenient for physicists to refer to.

It is also necessary to note that the τ neutrino can adjust the angle between the adjacent hybrid areas in natural atomic nucleus, while the W/Z bosons possesses the wavelength equivalent to hybrid interval.

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