Open Journal of Microphysics, 2011, 1, 1-12
doi:10.4236/ojm.2011.11001 Published Online May 2011 (http://www.SciRP.org/journal/ojm)

Hypothesis of Conservation of Particle Number

Kozo Aoki
Grande_Maison_Hosoyama 110, 5-25-7 *Hosoyama*, *Asao-ku*, *Kawasaki-shi, Kanagawa*, *Japan*
E-mail: *kozoaoki@gmail.com*
Received April 13, 2011; *revised May* 17, 2011; *accepted May* 24, 2011

Abstract

As for several nuclear reactions, the electroweak interaction is simply explained by a law of conservation of particle number. We find that the positron and electron consist of the three fundamental particles, $\{u,\bar{d},\bar{\nu}_e\}$ and $\{\bar{u},d,\nu_e\}$, respectively. Furthermore, the members of the second and third generations quark composites consist of the first generation quark and the neutrino of fundamental particles. The particle and its anti-particle pair(or neutrino and its antineutrino pair) have to be an energy quantum (or a photon). The minimum Higgs boson (called "*God particle*") might be a neutral pion. The fundamental particles are simply up and down quark, neutrino, muon-neutrino, and those anti-particles.

Keywords: Members Of Electron And Positron; Member Of Muon, Members Of $W^+/W^-/Z^0/B$ And Higgs Boson, Members Of Second And Third Generations Quark

1. Introduction

The common knowledge has been changed from the cosmological doctrine of the ancient greek Thales's famous belief, "*Water constituted the principle of all things*". Now we have many brain waves again. We put the new conceptual model for several nuclear reactions in fundamental mathematics (set and identity) and particle physics [1-4].

It is believing that the weak interaction is a CP violation. However it is based on parity conservation due to a conservation of particle number in this study. The neutron decay, $n \rightarrow p+\bar{e}+\bar{\nu}_e+h\nu$, is well-known nuclear reaction. With a weak boson for parity conservation, we need to innovate the neutron decay (β decay), the neutron-neutron chain reaction, the proton-proton chain reaction (β^+ decay), the tritium decay, the kaon decay, and the Λ decay by [5], by a law of conservation of particle number with the up and down quarks, the neutrinos, the muon-neutrinos, and their anti-particles. The members of electron, positron, and other composites are shown. It was drawn up the declaration of independence of the first generation's up and down quark.

2. A Paradox

Why an anti-matter is very low than a matter? To work out it, we have a paradox. The early universe was began from the sea of photons, and the early universe had equal parts of the elementary particle and its anti-particle. The broad or *cosmological* photon (γ) means an electromagnetic wave including gamma-ray. We assume that even now the anti-particle is equal amount of particle based on the idea which a photon consists of particle-antiparticle pair. Where is an anti-particle? It leads to a consevation of particle number. This is the reversal idea.

3. Description of Nuclear Reactions

3.1. Description of Neutron Decay

The neutron decay is shown by the following

$$n \rightarrow p+e^-+\bar{\nu}_e+h\nu$$

$$\{u,d,d\} \rightarrow \{u,u,d\}+e^-+\bar{\nu}_e+h\nu$$

The $h\nu$ indicates a photon (γ). Here we insert the variable composite X into the left side to adjust the numbers of elementary particles on both sides. The initial mysterious composite X{} is an empty set.

$$n+X \rightarrow P+e^-+\bar{\nu}_e+h\nu$$

$$\{u,d,d\}+X\{\} \rightarrow \{(u,d,d),(u,\bar{d})\}+e^-+\bar{\nu}_e+h\nu$$

The formulas are based on the law of conservation spin of the quantum, the law of conservation charge, and a law of conservation of particle number; the quantity adjustment of particle and anti-particle at the initial and final states. We assume the newly defined composite of proton $\{(u,u,d)(d,\bar{d})\} \rightleftharpoons \{(u,d,d,u,\bar{d})\} \rightleftharpoons \{(u,d,d)(u,\bar{d})\}$, instead of the traditional proton $\{p\}$, $\{u,u,d\}$. The $(d,\bar{d})$ pair is an energy quantum on the analogy of a photon. The $(d,\bar{d})$ rest mass is assumed zero, and the spin is $(1/2)+(1/2)=1$, since a photon mass is zero. Therefore it is considered as a broad (or an extended) photon. It is feasible assumption since the photon is a pair of neutrino and its anti-neutrino. If the $(d,\bar{d})$ is in P, the charged pion $(u,\bar{d})$ can exist in P. The u and $\bar{d}$ are added into the composite X due to adjust the quark of number of both sides.

$$\{u,d,d\}+X\{u,\bar{d}\} \to \{(u,d,d),(u,\bar{d})\}+e^-+\bar{\nu}_e+h\nu$$

But a number of neutrino is not ajust. When we think the electrons is not the fundamental particle, the number of neutrino can be ajust.

The $\bar{\nu}_e$ is added into the composite X due to adjust the number of both sides.

$$\{u,d,d\}+X\{u,\bar{d},\bar{\nu}_e\} \to \{(u,d,d),(u,\bar{d})\}+e^-+\bar{\nu}_e+h\nu$$

The $\bar{u}$, d, and ν_e are added into the composite X for the neutrality and complementarity.

$$\{u,d,d\}+X\{u,\bar{u},d,\bar{d},\nu_e,\bar{\nu}_e\} \to \{(u,d,d),(u,\bar{d})\}+e^-+\bar{\nu}_e+h\nu$$

If a kind of photon is $h\nu$, the $\{\nu_\mu,\bar{\nu}_\mu\}$ are added into the composite X. In this paper, the reactions are including a kind of photon $\{\nu_\mu,\bar{\nu}_\mu\}$ }. The P was shown by $\{(u,d,d),(u,\bar{d})\}$.

$$\{u,d,d\}+X\{u,\bar{u},d,\bar{d},\nu_e,\bar{\nu}_e,\nu_\mu,\bar{\nu}_\mu\} \to \{(u,d,d),(u,\bar{d})\}+e^-+\bar{\nu}_e+\{\nu_\mu,\bar{\nu}_\mu\}$$

The composite X consists of $\{u,\bar{u},d,\bar{d},\oplus_e,\oplus_\mu\}$. It is a Z boson (Z^0).

The '$\oplus$' indicates a photon.

The '$\oplus_e$' indicates the $\{\nu_e,\bar{\nu}_e\}$ pair.

The '$\oplus_\mu$' indicates the $\{\nu_\mu,\bar{\nu}_\mu\}$ pair.

The '$\oplus_{e\mu}$' indicates the $\{\oplus_e,\oplus_\mu\}$ pair.

The $\{u,\bar{d},\bar{\nu}_e\}$ and $\{\bar{u},d,\nu_e\}$ components are e^+ and e^-, respectively. A series of the neutron decay is as follows. Since the lifetime of Z^0 is very short, there are $\{\pi^0\}$ and $\{\oplus_{e\mu}\}$ in the initial state.

$$\begin{aligned}
&n+\{\pi^0\}+\{\oplus_{e\mu}\} \to n+Z^0\\
&\to \{u,d,d\}+\{u,\bar{u},d,\bar{d},\oplus_{e\mu}\}\\
&\to \{(u,d,d),(u,\bar{d}),(\bar{u},d,\oplus_e,\oplus_\mu)\}\\
&\to \{(u,d,d),(u,\bar{d})\}+\{(\bar{u},d,\nu_e),\bar{\nu}_e,(\oplus_\mu)\}\\
&\to \{(u,d,d),(u,\bar{d})\}+\{(\bar{u},d,\nu_e),\bar{\nu}_e\}+\{\oplus_\mu\}\\
&\to \{(u,d,d),(u,\bar{d})\}+\{\bar{u},d,\nu_e\}+\{\bar{\nu}_e\}+\{\oplus_\mu\}\\
&\to P+e^-+\bar{\nu}_e+\oplus_\mu
\end{aligned}$$

The composite $\{\bar{u},d,\nu_e,\bar{\nu}_e\}$ indicates the W^- boson. The $\{\bar{u},d,\nu_e\}+\{\bar{\nu}_e\}$ is equal to $(e^-+\bar{\nu}_e)$ The composite $\{\bar{u},d,\nu_e\}$ } indicates the electron (e^-). We can recognize that the spin of electron is simply explained by the electron of three members of fundamental particles.

3.2. Description of Neutron-Neutron Chain Reaction

The following is the initial expression for the neutron-neutron chain reaction.

$$n+n \to D+e^-+\bar{\nu}_e+h\nu$$

$$\{u,d,d\}+\{u,d,d\} \to \{u,u,d\}\{u,d,d\}+e^-+\bar{\nu}_e+h\nu$$

The deuterium, $D=\{u,u,d\}\{u,d,d\}$, is extended to $\{u,u,d\},\{u,\bar{d}\}\{u,d,d\}$. The nuclear reaction is rewritten with π^0, photons, and Z^0.

$$\begin{aligned}
&n+n+\{\pi^0\}+\{\oplus_{e\mu}\} \to n+n+Z^0\\
&\to \{u,d,d\}+\{u,d,d\}+\{u,\bar{u},d,\bar{d},\oplus_{e\mu}\}\\
&\to \{(u,d,d),(u,d,d),(u,\bar{u},d,\bar{d},\oplus_{e\mu})\}\\
&\to \{(u,d,d),(u,\bar{d})\}\{u,d,d\}\{\bar{u},d,\oplus_e,\oplus_\mu\}\\
&\to \{(u,d,d),(u,\bar{d})\}\{u,d,d\}+\{(\bar{u},d,\nu_e),\bar{\nu}_e,\oplus_\mu\}\\
&\to \{(u,d,d),(u,\bar{d})\}\{u,d,d\}+\{(\bar{u},d,\nu_e),\bar{\nu}_e\}+\{\oplus_\mu\}\\
&\to D+e^-+\bar{\nu}_e+\oplus_\mu
\end{aligned}$$

3.3. Description of Proton-Proton Chain Reaction

The two proton-proton chain reactions are shown.

$$p+p \to D+e^++\nu_e+h\nu$$

$$\{u,u,d\}+\{u,u,d\} \to \{u,u,d\}\{u,d,d\}+e^++\nu_e+h\nu$$

and

$$\begin{aligned}
p+p &\to D+\mu^++\nu_\mu\\
&\to D+(e^++\nu_e+\bar{\nu}_\mu)+\nu_\mu
\end{aligned}$$

$$\{u,u,d\}+\{u,u,d\}\to\{u,u,d\}\{u,d,d\}+\mu^{+}+\nu_{\mu}$$
$$\to\{u,u,d\}\{u,d,d\}+\left(e^{+}+\nu_{e}+\overline{\nu}_{\mu}\right)+\nu_{\mu}$$

Those are shown with the expression of newly defined proton $\left\{(u,d,d),(u,\underline{d})\right\}$.

$$P+P+\{\oplus_{e\mu}\}$$
$$\to\left\{(u,d,d),(u,\overline{d})\right\}+\left\{(u,d,d),(u,\overline{d})\right\}+\{\oplus_{e\mu}\}$$
$$\to\left\{(u,d,d),(u,\overline{d})\right\}\left\{(u,d,d),(u,\overline{d}),(\oplus_{e\mu})\right\}$$
$$\to\left\{(u,d,d),(u,\overline{d})\right\}\{u,d,d\}\left\{(u,\overline{d},\oplus_{e}),\oplus_{\mu}\right\}$$
$$\to\left\{(u,d,d),(u,\overline{d})\right\}\{u,d,d\}+\left\{(u,\overline{d},\overline{\nu}_{e}),\nu_{e}\right\}+\{\oplus_{\mu}\}$$
$$\to\left\{(u,d,d),(u,\overline{d})\right\}\{u,d,d\}+\{u,\overline{d},\overline{\nu}_{e}\}+\{\nu_{e}\}+\{\oplus_{\mu}\}$$
$$\to D+e^{+}+\nu_{e}+\oplus_{\mu}$$

and

$$P+P+\{\oplus_{e\mu}\}$$
$$\to\left\{(u,d,d),(u,\overline{d})\right\}+\left\{(u,d,d),(u,\overline{d})\right\}+\{\oplus_{e\mu}\}$$
$$\to\left\{(u,d,d),(u,\overline{d})\right\}\left\{(u,d,d),(u,\overline{d}),(\oplus_{e\mu})\right\}$$
$$\to\left\{(u,d,d),(u,\overline{d})\right\}\{u,d,d\}\{u,\overline{d},\oplus_{e},\oplus_{\mu}\}$$
$$\to\left\{(u,d,d),(u,\overline{d})\right\}\{u,d,d\}+\{u,\overline{d},\nu_{e},\overline{\nu}_{e},\overline{\nu}_{\mu}\}+\{\nu_{\mu}\}$$
$$\to D+\nu_{\mu}^{+}+\nu_{\mu}$$
$$\to\left\{(u,d,d),(u,\overline{d})\right\}\{u,d,d\}+\left\{(u,\overline{d},\overline{\nu}_{e}),\nu_{e},\overline{\nu}_{\mu}\right\}+\{\nu_{\mu}\}$$
$$\to D+\left(e^{+}+\nu_{e}+\overline{\nu}_{\mu}\right)+\nu_{\mu}$$

The energy quantum, $\{\oplus_{\mu}\}$, was written in the former reaction. It is unknown whether the $\{\oplus_{\mu}\}$ can be omit or not. The composite $\{u,\overline{d},\nu_{e},\overline{\nu}_{e}\}$ indicates the W^{+} boson. This reaction does not occur unless there are the neutrino-antineutrino pairs. The $\{u,d,\overline{\nu}_{e}\}$ $\{\nu_{e}\}$ is equal to $\left(e^{+}+\nu_{e}\right)$. The composite $\{u,d,\overline{\nu}_{e}\}$ indicates the positron $\left(e^{+}\right)$. The composite $\{\overline{u},d,\nu_{e},\overline{\nu}_{e},\overline{\nu}_{u}\}$ indicates a μ^{+} muon.

The cases with the Z^{0} boson are also considered. All bosons are composites.

$$P+P+\{\pi^{0}\}+\{\oplus_{e\mu}\}\to P+P+Z^{0}$$
$$\to\left\{(u,d,d),(u,\overline{d})\right\}+\left\{(u,d,d),(u,\overline{d})\right\}+\{Z^{0}\}$$
$$\to\left\{(u,d,d),(u,\overline{d})\right\}\left\{(u,d,d),(u,\overline{d}),(\pi^{0})),\oplus_{e},\oplus_{\mu}\right\}$$
$$\to\left\{(u,d,d),(u,\overline{d})\right\}\{u,d,d\}+\left\{(u,\overline{d},\oplus_{e}),(\pi^{0}),\oplus_{\mu}\right\}$$
$$\to\left\{(u,d,d),(u,\overline{d})\right\}\{u,d,d\}+\{u,\overline{d},\overline{\nu}_{e}\}+\left\{\nu_{e},(\pi^{0}),(\oplus_{\mu})\right\}$$
$$\to D+e^{+}+\nu_{e}+\{\pi^{0}\}+\{\oplus_{\mu}\}$$

and

$$P+P+\{\pi^{0}\}+\{\oplus_{e\mu}\}\to P+P+Z^{0}$$
$$\to\left\{(u,d,d),(u,\overline{d})\right\}+\left\{(u,d,d),(u,\overline{d})\right\}+\{Z^{0}\}$$
$$\to\left\{(u,d,d),(u,\overline{d})\right\}\left\{(u,d,d),(u,\overline{d}),(\pi^{0}),\oplus_{e},\oplus_{\mu}\right\}$$
$$\to\left\{(u,d,d),(u,\overline{d})\right\}\{u,d,d\}\left\{(u,\overline{d},\oplus_{e\mu}),(\pi^{0})\right\}$$
$$\to\left\{(u,d,d),(u,\overline{d})\right\}\{u,d,d\}$$
$$+\left(u,\overline{d},\nu_{e},\overline{\nu}_{e},\overline{\nu}_{\mu}\right)+\{\nu_{\mu}\}+\{\pi^{0}\}$$
$$\left(\to D+\nu_{\mu}^{+}+\nu_{\mu}+\{\pi^{0}\}\right)$$
$$\to\left\{(u,d,d),(u,\overline{d})\right\}\{u,d,d\}$$
$$+\left\{(u,\overline{d},\overline{\nu}_{e}),\nu_{e},\overline{\nu}_{\mu}\right\}+\{\nu_{\mu}\}+\{\pi^{0}\}$$
$$\to\left\{(u,d,d),(u,\overline{d})\right\}\{u,d,d\}$$
$$+\left\{(u,\overline{d},\overline{\nu}_{e}),\nu_{e},\overline{\nu}_{\mu}\right\}+\{\nu_{\mu}\}+\{\pi^{0}\}$$

3.4. Description of Tritium Decay

The tritium decay is $T\to{}^{3}He^{+}+e^{-}+\overline{\nu}_{e}+h\nu$.

$$T\to\left\{(u,d,d),(u,\overline{d})\right\}\{e^{-}\}\{u,d,d\}\{u,d,d\}$$
$$\to\left\{(u,d,d),(u,\overline{d})\right\}\{e^{-}\}\{u,d,d\}\left\{(u,d,d),(u,\overline{d})\right\}$$
$$+\{\overline{u},d,\nu_{e}\}+\{\overline{\nu}_{e}\}+h\nu$$
$$\to{}^{3}He^{+}+e^{-}+\overline{\nu}_{e}+h\nu$$

It seems that the Z^{0} boson is missing. The new expression is $T+Z^{0}\to{}^{3}He^{+}+e^{-}+\overline{\nu}_{e}+h\nu$

$$T+(\pi^{0})+\{\oplus_{e\mu}\}\to T+Z^{0}$$
$$\to\left\{(u,d,d),(u,\overline{d})\right\}\left\{(e^{-})\right\}\{u,d,d\}\{u,d,d\}$$
$$+\{u,\overline{u},d,\overline{d},\oplus_{e\mu}\}$$
$$\to\{(P)\}\left\{(e^{-})\right\}\{(n)\}\{(n)\}+\{u,\overline{u},d,\overline{d},\oplus_{e},\oplus_{\mu}\}$$
$$\to\{(P)\}\left\{(e^{-})\right\}\{(n)\}\{(P)\}\left\{(\overline{u},d,\nu_{e},\overline{\nu}_{e}),(\oplus_{\mu})\right\}$$
$$\to\{(P)\}\left\{(e^{-})\right\}\{(n)\}\{(P)\}$$
$$+\left\{(\overline{u},d,\nu_{e}),\overline{\nu}_{e}\right\}+\{\oplus_{\mu}\}$$
$$\to\{(P)\}\left\{(e^{-})\right\}\{(n)\}\{(P)\}$$
$$+\{\overline{u},d,\nu_{e}\}+\{\overline{\nu}_{e}\}+\{\oplus_{\mu}\}$$
$$\to{}^{3}He^{+}+e^{-}+\overline{\nu}_{e}+\oplus_{\mu}$$

The $\left\{(e^{-})\right\}$ is the tritium or Helium's extranuclear electron.

4. Identity of Fundamental Particle Composites

It is considered that the traditional fundamental partricles (a boson, a meson, and a second and third generation's quark) will be a composites, since the electron are not the fundamental particle in this study.

4.1. Identity of the Z^0 boson in Early Universe

In early universe, the relationship among the Z^0 boson, elementary particles, leptons, and photons is described as follows. In the initial early universe, it is thought that only the photons ($\oplus_u$, $\oplus_d$, $\oplus_e$, and $\oplus_\mu$) exist.

$$
\begin{aligned}
&[\oplus_u][\oplus_d][\oplus_e][\oplus_\mu] = [u,\bar{u},d,\bar{d},\nu_e,\bar{\nu}_e,\nu_\mu,\bar{\nu}_\mu] \equiv [Z^0] \\
&= [u,\bar{d},\nu_e,\bar{\nu}_e,\nu_\mu,\bar{\nu}_\mu][\bar{u},d] \equiv [W^+][\pi^-] = [u,\bar{d}][\bar{u},d,\nu_e,\bar{\nu}_e,\nu_\mu,\bar{\nu}_\mu] \equiv [\pi^+][W^-] \\
&= [u,\bar{d},\nu_e,\bar{\nu}_e,\bar{\nu}_\mu][\bar{u},d][\nu_\mu] \equiv [\mu^+][\pi^-][\nu_\mu] = [u,\bar{d}][\bar{u},d,\nu_e,\bar{\nu}_e,\nu_\mu][\bar{\nu}_\mu] \equiv [\pi^+][\mu^-][\bar{\nu}_\mu] \\
&= [u,\bar{d},\bar{\nu}_e][\bar{u},d,\nu_e][\nu_\mu,\bar{\nu}_\mu] \equiv [e^+][e^-][\nu_\mu,\bar{\nu}_\mu] = [u,\bar{d}][\bar{u},d,\nu_e][\bar{\nu}_e][\nu_\mu,\bar{\nu}_\mu] \equiv [\pi^+][e^-][\bar{\nu}_e][\nu_\mu,\bar{\nu}_\mu] \\
&= [u,\bar{d},\bar{\nu}_e][\bar{u},d][\nu_e][\nu_\mu,\bar{\nu}_\mu] \equiv [e^+][\pi^-][\nu_e][\nu_\mu,\bar{\nu}_\mu] = [u,\bar{d}][\bar{u},d][\nu_e,\bar{\nu}_e][\nu_\mu,\bar{\nu}_\mu] \equiv [\pi^+][\pi^-][\nu_e,\bar{\nu}_e][\nu_\mu,\bar{\nu}_\mu] \\
&= [u,\bar{d},\bar{u},d][\nu_e,\bar{\nu}_e][\nu_\mu,\bar{\nu}_\mu] \equiv [\pi^0][\nu_e,\bar{\nu}_e][\nu_\mu,\bar{\nu}_\mu]
\end{aligned}
$$

Next is the relationship among elementary particles, protons, neutrons, and photons.

$$
\begin{aligned}
&[\oplus_u][\oplus_d][\oplus_d][\oplus_u][\oplus_d] = [u,\bar{u}][d,\bar{d}][d,\bar{d}][u,\bar{u}][d,\bar{d}] \\
&= [u,d,d][\bar{u},\bar{d},\bar{d}][u,\bar{u},d,\bar{d}] \equiv [n][\bar{n}][\pi^0] \\
&= [(u,d,d),(u,\bar{d})][(\bar{u},\bar{d},\bar{d})(\bar{u},d)] \equiv [(n)(\pi^+)][(\bar{n})(\pi^-)] \equiv [P][\bar{P}] \\
&= [(u,u,d)(d,\bar{d})][(\bar{u},\bar{u},\bar{d})(\bar{d},d)] \equiv [(p)(d,\bar{d})][(\bar{p})(\bar{d},d)] \equiv [P][\bar{P}] \\
&= [(u,d,d),(u,\bar{d})][(\bar{u},\bar{d},\bar{d})(u,\bar{d})] \equiv [(n)(\pi^-)][(\bar{n})(\pi^+)] \\
&= [(d,d,d)(u,\bar{u})][(\bar{d},\bar{d},\bar{d})(u,\bar{u})] \equiv [(p_2)(u,\bar{u})][(\bar{p}_2)(u,\bar{u})] \equiv [P_2^-][P_2^+] \\
&= [(u,d,d)(\bar{u},u)][(\bar{u},\bar{d},\bar{d})(d,\bar{d})] \equiv [(n)(\bar{u},u)][(\bar{n})(d,\bar{d})] \\
&= [(u,u,d)(\bar{u},d)][(\bar{d},\bar{d},\bar{d})(\bar{u},d)] \equiv [(p)(\pi^-)][(\bar{p}_2)(\pi^-)] \\
&= [(u,d,d)(\bar{d},d)][(\bar{u},\bar{d},\bar{d})(u,\bar{u})] \equiv [(n)(\bar{d},d)][(\bar{n})(u,\bar{u})] \\
&= [(d,d,d)(u,\bar{d})][(\bar{u},\bar{u},\bar{d})(u,\bar{d})] \equiv [(p_2)(\pi^+)][(\bar{p})(\pi^+)]
\end{aligned}
$$

The P_2^- indicates a second newly defined proton with negative charge.

The P_2^+ indicates a second newly defined proton with positive charge.

We have the sense of the duality principle between the particle and wave for a photon. The next expression with the π^0 boson is the electron-positron pair annihi- lation by [6]. The gamma-ray (γ) indicates the neutrino and its antineutrino connection.

$$
\begin{aligned}
&e^+ + e^- \to \{(u,\bar{d},\bar{\nu}_e),(\bar{u},d,\nu_e)\} \\
&\to \{(u,\bar{d},\bar{u},d),(\nu_e,\bar{\nu}_e)\} \to \{(\pi^0),(\oplus_e)\} \\
&\to \{\pi^0\} + \gamma \to \{\pi^0\} + \{\oplus_e\}
\end{aligned}
$$

$$
\begin{aligned}
&e^+ + e^- + \gamma \to \{(u,\bar{d},\bar{\nu}_e),(\bar{u},d,\nu_e),(\nu_\mu,\bar{\nu}_\mu)\} \\
&\to \{(u,\bar{d},\bar{u},d),(\nu_e,\bar{\nu}_e),(\nu_\mu,\bar{\nu}_\mu)\} \\
&\to \{(\pi^0),\oplus_e,\oplus_\mu\} \to \{\pi^0\} + \{\oplus_e\} + \{\oplus_\mu\} \\
&\to \{\pi^0\} + 2\gamma
\end{aligned}
$$

Next indicates an electron-positron pair creation.

$$
\begin{aligned}
&\pi^0 + \gamma \to \{\pi^0,\oplus_e\} \\
&\to \{(u,\bar{d},\bar{\nu}_e),(\bar{u},d,\nu_e)\} \\
&\to \{u,\bar{d},\bar{\nu}_e\} + \{\bar{u},d,\nu_e\} \\
&\to e^+ + e^-
\end{aligned}
$$

The energy quanta (or the photon) ($\{\oplus_u\}$, $\{\oplus_d\}$, $\{\oplus_e\}$ and $\{\oplus_u\}$) indicate $\{u,\ \overline{u}\}$, $\{d,\ \overline{d}\}$, $\{\nu_e,\ \overline{\nu}_e\}$, and $\{\nu_\mu, \overline{\nu}_\mu\}$, respectively.

The energy quanta and particle, $\{\oplus_u\}$, $\{\oplus_d\}$, $\{\oplus_e\}$, $\{\oplus_u\}$ and $\{\pi^0\}$ may be dark energy and dark matter in space.

4.2. Identity of the Strange and Charm quark

The charged kaons, K^+ and K^-, consist of $\{u,(\overline{s})\}$ and $\{\overline{u},(s)\}$, respectively. The main K^+ decay is $K^+ \to \mu^+ + \nu_\mu$. The μ^+ muon consists of $\{u,\overline{d},\nu_e,\overline{\nu}_e,\overline{\nu}_\mu\}$.

$$K^+ \to \{(u,\overline{d},\nu_e,\overline{\nu}_e,\overline{\nu}_\mu),\nu_\mu\} = \{u,\overline{d},\oplus_{e\mu}\}$$
$$\to \{u,\overline{d},\nu_e,\overline{\nu}_e,\overline{\nu}_\mu\} + \nu_\mu$$
$$\to \mu^+ + \nu_\mu$$

$$(K^+) = \{u,(\overline{s})\}$$
$$= \{u,(\overline{d},\oplus_{e\mu})\}$$
$$= \{(u,\overline{d}),\oplus_{e\mu}\}$$
$$= \{(\pi^+),\oplus_{e\mu}\}$$
$$(\overline{s}) = \{\overline{d},\oplus_{e\mu}\} = \{\overline{d},\oplus_e,\oplus_\mu\}$$

In the same way, the K^- kaon and s quark compositions are found.

$$(K^-) = \{\overline{u},(s)\}$$
$$= \{\overline{u},(d,\oplus_{e\mu})\}$$
$$= \{(\overline{u},d),\oplus_{e\mu}\}$$
$$= \{(\pi^-),\oplus_{e\mu}\}$$
$$(s) = \{d,\oplus_{e\mu}\} = \{d,\oplus_e,\oplus_\mu\}$$

The charged kaons consist of the charged pion and the neutrino-antineutrino pairs (or energy quanta). The neutral kaons, K^0 and $\overline{K}^0$, consist of $(d,\overline{s})$ and $(\overline{d},s)$, respectively.

$$(K^0) = \{d,(\overline{s})\}$$
$$= \{d,\overline{d},\oplus_{e\mu}\}$$
$$= \{\oplus_d,\oplus_{e\mu}\}$$

$$(\overline{K}^0) = \{\overline{d},(s)\}$$
$$= \{\overline{d},d,\oplus_{e\mu}\}$$
$$= \{\oplus_d,\oplus_{e\mu}\}$$
$$= \{K^0\}$$

$$(Z^0) = \{(\pi^0),\oplus_{e\mu}\} = \{(\pi^0),\oplus_e,\oplus_\mu\}$$
$$= \{(\pi^+),(\pi^-),\oplus_{e\mu}\}$$
$$= \{(u,\overline{d}),(\overline{u},d),\oplus_{e\mu}\}$$
$$= \{(u,\overline{u},d,\overline{d}),\oplus_{e\mu}\}$$
$$= \{(u,\overline{u}),(d,\overline{d}),\oplus_{e\mu}\}$$
$$= \{\oplus_u,\oplus_d,\oplus_{e\mu}\}$$
$$= \{\oplus_u,(K^0)\}$$
$$= \{\oplus_u,(\overline{K}^0)\}$$

By the result of the strange quark, the charm and anti-charm quarks are shown from the Ω^0 decay by [7].

$$\Omega^0 \to \Omega^- + \pi^+$$
$$\{s,s,c\} \to \{s,s,s\} + \{u,\overline{d}\}$$

$$(c) = \{(s),u,\overline{d}\} = \{(s),(\pi^+)\}$$
$$= \{d,\oplus_{e\mu},u,\overline{d}\}$$
$$= \{d,\oplus_{e\mu},(\pi^+)\} = \{d,(K^+)\}$$
$$= \{u,d,\overline{d},\oplus_{e\mu}\} = \{u,(K^0)\}$$

$$(\overline{c}) = \{(\overline{s}),\overline{u},d\} = \{(\overline{s}),(\pi^-)\}$$
$$= \{\overline{d},\oplus_{e\mu},\overline{u},d\}$$
$$= \{\overline{d},\oplus_{e\mu},(\pi^-)\} = \{\overline{d},(K^-)\}$$
$$= \{\overline{u},d,\overline{d},\oplus_{e\mu}\} = \{\overline{u},(K^0)\}$$

The second, third, and fourth K^+ decays are shown by $K^+ \to \pi^+ + \pi^0$, $K^+ \to \pi^+ + \pi^+ + \pi^-$, and $K^+ \to \pi^+ + \pi^0 + \pi^0$. It seems that the Z^0 bosons are missing in the left sides. We consider about $K^+ + Z^0 \to \pi^+ + \pi^0$, $K^+ + Z^0 \to \pi^+ + \pi^+ + \pi^-$, and $K^+ + Z^0 + Z^0 \to \pi^+ + \pi^0 + \pi^0$. Their reactions are revolved.

$$K^+ + Z^0 \to \{u,\overline{d},\oplus_{e\mu}\} + \{u,\overline{u},d,\overline{d},\oplus_{e\mu}\}$$
$$\to \{(u,\overline{d}),(u,\overline{d},\overline{u},d),\oplus_{e\mu},\oplus_{e\mu}\}$$
$$\to \pi^+ + \pi^0 + \{\oplus_{e\mu},\oplus_{e\mu}\}$$

$$K^+ + Z^0 \to \{u,\overline{d},\oplus_{e\mu}\} + \{u,\overline{u},d,\overline{d},\oplus_{e\mu}\}$$
$$\to \{(u,\overline{d}),(u,\overline{d},\overline{u},d),\oplus_{e\mu},\oplus_{e\mu}\}$$
$$\to \{(u,\overline{d}),(u,\overline{d}),(\overline{u},d),\oplus_{e\mu},\oplus_{e\mu}\}$$
$$\to \pi^+ + \pi^+ + \pi^- + \{\oplus_{e\mu},\oplus_{e\mu}\}$$

and

$$K^+ + Z^0 + Z^0$$
$$\to \{u,\bar{d},\oplus_{e\mu}\} + \{u,\bar{u},d,\bar{d},\oplus_{e\mu}\} + \{u,\bar{u},d,\bar{d},\oplus_{e\mu}\}$$
$$\to \{(u,\bar{d}),(u,\bar{d},\bar{u},d),(u,\bar{d},\bar{u},d),(\oplus_e,\oplus_\mu),\oplus_{e\mu},\oplus_{e\mu}\}$$
$$\to \pi^+ + \pi^0 + \pi^0 + \{\oplus_{e\mu},\oplus_{e\mu},\oplus_{e\mu}\}$$

The rare K^+ decay is $K^+ \to \pi^0 + e^+ + \nu_e$. It seems that the Z^0 boson is also missing in the left side. We consider about $K^+ + Z^0 \to \pi^0 + e^+ + \nu_e$

$$K^+ + Z^0 \to \{u,\bar{d},\oplus_{e\mu}\} + \{u,\bar{u},d,\bar{d},\nu_e,\bar{\nu}_e,\oplus_\mu\}$$
$$\to \{(u,\bar{d},\bar{u},d),(u,\bar{d},\bar{\nu}_e),\nu_e,\oplus_\mu,\oplus_{e\mu}\}$$
$$\to \{u,\bar{d},\bar{u},d\} + \{u,\bar{d},\bar{\nu}_e\} + \{\nu_e\} + \{\oplus_\mu,\oplus_{e\mu}\}$$
$$\to \pi^0 + e^+ + \nu_e + \{\oplus_\mu,\oplus_{e\mu}\}$$

It is considered that the π^+ creation is more favorable than the $(e^+ + \nu_e)$ one by comparing the second, third, and fourth K^+ decays with the rare K^+ one. The K_s consists of the $\{d,\bar{s},s,\bar{d}\}$.

$$(K_s) = \{d,(\bar{s}),(s),\bar{d}\} = \{d,(\bar{d},\oplus_{e\mu}),(d,\oplus_{e\mu}),\bar{d}\}$$

The K_s decays are $K_s \to \pi^+ + \pi^-$ and $K_s \to \pi^0 + \pi^0$. It seems that the Z^0 bosons are missing in the left sides. Their reactions are as follows.

$$K_s + Z^0 \to \{d,(\bar{d},\oplus_{e\mu}),(d,\oplus_{e\mu}),\bar{d}\} + \{u,\bar{u},d,\bar{d},\oplus_{e\mu}\}$$
$$\to \{(u,\bar{d}),(\bar{u},d),\oplus_{e\mu},(d,\bar{d}),\oplus_{e\mu},(\bar{d},d),\oplus_{e\mu}\}$$
$$\to \{u,\bar{d}\} + \{\bar{u},d\} + \{\oplus_{e\mu},\oplus_d,\oplus_{e\mu},\oplus_d,\oplus_{e\mu}\}$$
$$\to \pi^+ + \pi^- + \{\oplus_{e\mu},\oplus_d,\oplus_{e\mu},\oplus_d,\oplus_{e\mu}\}$$

$$K_s + Z^0 + Z^0 \to \{d,(\bar{d},\oplus_{e\mu}),(d,\oplus_{e\mu}),\bar{d}\}$$
$$+ \{u,\bar{u},d,\bar{d},\oplus_{e\mu}\} + \{u,\bar{u},d,\bar{d},\oplus_{e\mu}\}$$
$$\to \{(u,\bar{d},\bar{u},d),\oplus_{e\mu},(u,\bar{d},\bar{u},d),\oplus_{e\mu},$$
$$(d,\bar{d}),\oplus_{e\mu},(\bar{d},d),\oplus_{e\mu}\}$$
$$\to \{u,\bar{d},\bar{u},d\} + \{u,\bar{d},\bar{u},d\} + \{\oplus_{e\mu},\oplus_{e\mu},\oplus_d,\oplus_{e\mu},\oplus_d,\oplus_{e\mu}\}$$
$$\to \pi^0 + \pi^0 + \{\oplus_{e\mu},\oplus_{e\mu},\oplus_d,\oplus_{e\mu},\oplus_d,\oplus_{e\mu}\}$$

The K_l decay is $K_l \to \pi^+ + e^- + \bar{\nu}_e$.

$$K_l + Z^0 \to \{d,(\bar{d},\oplus_{e\mu}),(d,\oplus_{e\mu}),\bar{d}\} + \{u,\bar{u},d,\bar{d},\oplus_{e\mu}\}$$
$$\to \{(u,\bar{d}),(\bar{u},d,\nu_e),\bar{\nu}_e,\oplus_\mu,(d,\bar{d}),\oplus_{e\mu},(\bar{d},d),\oplus_{e\mu}\}$$
$$\to \{u,\bar{d}\} + \{\bar{u},d,\nu_e\} + \{\bar{\nu}_e\} + \{\oplus_\mu,\oplus_d,\oplus_{e\mu},\oplus_d,\oplus_{e\mu}\}$$
$$\to \pi^+ + e^- + \bar{\nu}_e + \{\oplus_\mu,\oplus_d,\oplus_{e\mu},\oplus_d,\oplus_{e\mu}\}$$

The very rare K^+ decay is $K^+ \to \pi^+ + \nu + \bar{\nu}$ by [8]. It is connsidered that $K^+ \to \pi^+ + \nu + \bar{\nu} + h\nu$. Since the K^+ consists of $\{(\pi^+),\oplus_{e\mu}\}$, the $\oplus_e$ and $\oplus_\mu$ corresponding to $(\nu + \bar{\nu})$ and $h\nu$, respectively. The pair connection of the particle and its antiparticle is regarded as an annihilation in this study.

4.3. Identity of the Lambda particle (Description of the Lambda Decay)

The Λ^0 decays are shown by the three reactions.

$$\Lambda^0 \to n + \pi^0$$
$$\Lambda^0 \to P + \pi^-$$

and

$$\Lambda^0 \to P + \mu^- + \nu_\mu$$

The expressions of the quarks and neutrinos as follows.

$$\{u,d,s\} \to \{u,d,d\} + \{u,\bar{d},\bar{u},d\}$$
$$\{u,d,s\} \to \{(u,d,d),(u,\bar{d})\} + \{\bar{u},d\}$$

and

$$\{u,d,s\} \to \{(u,d,d),(u,\bar{d})\} + \{\bar{u},d,\nu_e,\bar{\nu}_e,\bar{\nu}_\mu\} + \nu_\mu$$

The expressions are changed by $\{s\} = \{d,\oplus_{e\mu}\} = \{d,\oplus_e,\oplus_\mu\}$.

$$\{u,d,(d,\oplus_{e\mu})\} \to \{u,d,d\} + \{u,\bar{d},\bar{u},d\}$$
$$\{u,d,(d,\oplus_{e\mu})\} \to \{(u,d,d),(u,\bar{d})\} + \{\bar{u},d\}$$

and

$$\{u,d,(d,\oplus_{e\mu})\}$$
$$\to \{(u,d,d),(u,\bar{d})\} + \{\bar{u},d,\nu_e,\bar{\nu}_e,\bar{\nu}_\mu\} + \nu_\mu$$

It seems that the Z^0 bosons are missing in the left sides.

$$\{u,d(d,\oplus_{e\mu})\} + \{u,\bar{u},d,\bar{d},\oplus_{e\mu}\}$$
$$\to \{u,d,d\} + \{u,\bar{d},\bar{u},d\}$$

$$\{u,d,(d,\oplus_{e\mu})\} + \{u,\bar{u},d,\bar{d},\oplus_{e\mu}\}$$
$$\to \{(u,d,d),(u,\bar{d})\} + \{\bar{u},d\}$$

and

$$\{u,d,(d,\oplus_{e\mu})\} + \{u,\bar{u},d,\bar{d},\oplus_{e\mu}\}$$
$$\to \{(u,d,d),(u,\bar{d})\}\{\oplus_{e\mu}\} + \{\bar{u},d,\nu_e,\bar{\nu}_e,\bar{\nu}_\mu\} + \nu_\mu$$

The reactions with the addition of photon as follows.

$$\Lambda^0 + Z^0 \to \left\{u,d,\left(d,\oplus_{e\mu}\right)\right\} + \left\{u,\bar{u},d,\bar{d},\oplus_{e\mu}\right\}$$
$$\to \left\{u,d,\left(d,\oplus_{e\mu}\right),\left(u,\bar{u},d,\bar{d},\oplus_{e\mu}\right)\right\}$$
$$\to \{u,d,d\} + \left\{u,\bar{d},\bar{u},d\right\} + \left\{\oplus_{e\mu}\right\}\left\{\oplus_{e\mu}\right\}$$
$$\to n + \pi^0 + \left\{\oplus_{e\mu}\right\}\left\{\oplus_{e\mu}\right\}$$

$$\Lambda^0 + Z^0 \to \left\{u,d,\left(d,\oplus_{e\mu}\right)\right\} + \left\{u,\bar{u},d,\bar{d},\oplus_{e\mu}\right\}$$
$$\to \left\{u,d,\left(d,\oplus_{e\mu}\right),\left(u,\bar{u},d,\bar{d},\oplus_{e\mu}\right)\right\}$$
$$\to \left\{(u,d,d),\left(u,\bar{d}\right)\right\} + \{\bar{u},d\} + \left\{\oplus_{e\mu}\right\}\left\{\oplus_{e\mu}\right\}$$
$$\to P + \pi^- + \left\{\oplus_{e\mu}\right\}\left\{\oplus_{e\mu}\right\}$$

and

$$\Lambda^0 + Z^0 \to \left\{u,d,\left(d,\oplus_{e\mu}\right)\right\} + \left\{u,\bar{u},d,\bar{d},\oplus_{e\mu}\right\}$$
$$\to \left\{u,d,\left(d,\oplus_{e\mu}\right),\left(u,\bar{u},d,\bar{d},\nu_e,\bar{\nu}_e,\bar{\nu}_\mu,\nu_\mu\right)\right\}$$
$$\to \left\{(u,d,d),\left(u,\bar{d}\right)\right\} + \left\{(\bar{u},d,\nu_e),\bar{\nu}_e,\bar{\nu}_\mu\right\}$$
$$+ \left\{\nu_\mu\right\} + \left\{\oplus_{e\mu}\right\}$$
$$\to P + \mu^- + \nu_\mu + \left\{\oplus_{e\mu}\right\}$$

The Λ^0 particle consists of $\left\{u,d,\left(d,\oplus_{e\mu}\right)\right\} = \left\{(u,d,d),\oplus_{e\mu}\right\}$. The Λ^0 particle includes the neutron.

4.4. Identity of the Bottom and Top quark

The Λ_b^0 consists of (u,d,b). Its two decays are $\Lambda_b^0 \to p + \pi^-$ and $\Lambda_b^0 \to p + K^-$ as shown by [9]. Their Λ_b^0 decays are shown.

$$\{u,d,b\} \to \left\{(u,d,d),\left(u,\bar{d}\right)\right\} + \{\bar{u},d\}$$
$$\{u,d,b\} \to \left\{(u,d,d),\left(u,\bar{d}\right)\right\} + \left\{\bar{u},d,\oplus_{e\mu}\right\}$$

If b quark is a composite, the minimum configuration's b quark is equal to $\left\{d,\left(u,\bar{d},\bar{u},d\right)\right\} = \left\{d,\left(\pi^0\right)\right\}$. The other configuration's b quark consists of

$$\left\{d,\left(u,\bar{d},\bar{u},d\right),\left(\oplus_e,\oplus_\mu\right)\right\} = \left\{d,\left(\pi^0\right),\left(\oplus_{e\mu}\right)\right\} = \left\{d,\left(Z^0\right)\right\}$$

We recognize the top and anti-top quarks produced in proton-antiproton collisions by [10]. The top quarks instantly decay into two W bosons and two b quarks. One W in turn decays into a muon and a neutrino, the other into up and down quarks. The general reaction is considered.

$$P + \bar{P} \to t + \bar{t} \to \left(W^+ + b\right) + \left(W^- + \bar{b}\right)$$
$$\left(W^+\right) = \left\{u,\bar{d},\oplus_e\right\} = \left\{\left(\pi^+\right),\oplus_e\right\}$$
$$\left(W^-\right) = \left\{\bar{u},d,\oplus_e\right\} = \left\{\left(\pi^-\right),\oplus_e\right\}$$
$$(b) = \left\{d,\left(u,\bar{d},\bar{u},d\right)\right\} = \left\{\bar{d},\left(\pi^0\right)\right\}$$
$$\left(\bar{b}\right) = \left\{\bar{d},\left(u,\bar{d},\bar{u},d\right)\right\} = \left\{\bar{d},\left(\pi^0\right)\right\}$$

The proton-antiproton collision, $P + \bar{P} \to \left(t + \bar{t}\right) \to \left(W^+ + b\right) + \left(W^- + \bar{b}\right)$, is shown from the above relationship.

$$P + \bar{P} = \left\{(u,d,d),\left(u,\bar{d}\right)\right\} + \left\{\bar{u},\bar{d},\bar{d}\right\}\{\bar{u},d\}$$
$$\to \left(t + \bar{t}\right) \to \left(W^+ + b\right) + \left(W^- + \bar{b}\right)$$
$$= \left\{u,\bar{d},\oplus_e\right\} + \left\{d,\left(u,\bar{d},\bar{u},d\right)\right\}$$
$$+ \left\{\bar{u},d,\oplus_e\right\} + \left\{\bar{d},\left(u,\bar{d},\bar{u},d\right)\right\}$$
$$= \left\{\left(u,\bar{d},\oplus_e\right),\nu_e\right\} + \left\{d,\left(u,\bar{d},\bar{u},d\right)\right\}$$
$$+ \left\{\left(\bar{u},d,\oplus_e\right),\bar{\nu}_e\right\} + \left\{\bar{d},\left(u,\bar{d},\bar{u},d\right)\right\}$$

The anti-proton is used by $\left\{\left(\bar{u},\bar{d}.\bar{d}\right),(\bar{u},d)\right\}$ instead of $\left\{\bar{u},\bar{u},\bar{d}\right\}$. It can not explain by $\left\{\bar{u},\bar{u},\bar{d}\right\}$. Therefore the anti-proton is either by the $\left\{\bar{u},\bar{d},\bar{d}\right\}$ $\{\bar{u},d\}$ or $\left\{\bar{u},\bar{d},\bar{d},\bar{u},d\right\}$ structure in nature. The following is the $\left(t + \bar{t}\right)$ configuration.

$$\left(t + \bar{t}\right) = \left(W^+ + b\right) + \left(W^- + \bar{b}\right)$$
$$= \left\{u,\bar{d},\oplus_e\right\} + \left\{d,\left(u,\bar{d},\bar{u},d\right)\right\} + \left\{\bar{u},d,\oplus_e\right\} + \left\{\bar{d},\left(u,\bar{d},\bar{u},d\right)\right\}$$
$$= \left\{(u,d,d),\left(u,\bar{d}\right),\left(\oplus_e\right),\bar{d},\bar{u}\right\} + \left\{\left(\bar{u},\bar{d},\bar{d}\right),(\bar{u},d),\left(\oplus_e\right),(u,d)\right\}$$
$$= \left\{(u,d,d),\left(u,\bar{d}\right)\right\} + \left\{\left(\bar{u},\bar{d},\bar{d}\right),(\bar{u},d)\right\} + \left\{\left(u,\bar{d},\bar{u},d\right),\left(\oplus_e,\oplus_e\right)\right\}$$
$$= \left\{(u,d,d),\left(u,\bar{d}\right)\right\} + \left\{\left(\bar{u},\bar{d},\bar{d}\right),(\bar{u},d)\right\} + \left\{\left(\pi^0\right),\oplus_{ee}\right\}$$

Thus, the proton-antiproton collision needs the component of $\left\{\left(\pi^0\right),\oplus_{ee}\right\} = \left\{\left(Z^0\right)\right\}$. The following is the ideal expression of a series of proton-antiproton collisions.

$$P+\bar{P}+\left\{\left(\pi^{0}\right),\oplus_{ee}\right\}\to\left\{\left(u,d,d\right),\left(u,\bar{d}\right)\right\}+\left\{\left(\bar{u},\bar{d},\bar{d}\right),\left(\bar{u},d\right)\right\}+\left\{\left(\pi^{0}\right),\left(\oplus_{e},\oplus_{e}\right)\right\}$$
$$\to\left(t+\bar{t}\right)\to\left\{\left(u,d,d\right),\left(u,\bar{d}\right),\left(\oplus_{e}\right),\left(\bar{d},\bar{u}\right)\right\}+\left\{\left(\bar{u},\bar{d},\bar{d}\right),\left(\bar{u},d\right),\left(\oplus_{e}\right),\left(u,d\right)\right\}$$
$$=\left\{u,\left(u,d,d\right),\left(\bar{u},\bar{d},\bar{d}\right),\left(\oplus_{e}\right)\right\}+\left\{\bar{u},\left(u,d,d\right),\left(\bar{u},\bar{d},\bar{d}\right),\left(\oplus_{e}\right)\right\}$$
$$=\left\{u,\left(n,\bar{n}\right),\left(\oplus_{e}\right)\right\}+\left\{\bar{u},\left(n,\bar{n}\right),\left(\oplus_{e}\right)\right\}$$
$$\to\left(W^{+}+b\right)+\left(W^{-}+\bar{b}\right)\to\left\{u,\bar{d},\oplus_{e}\right\}+\left\{d,\left(u,\bar{d},\bar{u},d\right)\right\}+\left\{\bar{u},d,\oplus_{e}\right\}+\left\{\bar{d},\left(u,\bar{d},\bar{u},d\right)\right\}$$
$$\to\left\{\left(u,\bar{d},\nu_{e}\right),\bar{\nu}_{e}\right\}+\left\{d,\left(u,\bar{d},\bar{u},d\right)\right\}+\left\{\left(\left(\bar{u},d,\nu_{e}\right),\bar{\nu}_{e}\right\}+\left\{\bar{d},\left(u,\bar{d},\bar{u},d\right)\right\}$$
$$\to\left(e^{+}+\nu_{e}+\left\{d,\left(\pi^{0}\right)\right\}\right)+\left(e^{-}+\bar{\nu}_{e}+\left\{\bar{d},\left(\pi^{0}\right)\right\}\right)$$

From the above nuclear reactions, the energy quanta pair is a pair of $\oplus_e$ and $\oplus_e$, not a pair of $\oplus_e$ and $\oplus_\mu$. Therefore we try to use the $\left\{\oplus_e,\oplus_\mu\right\}$ pair instead of the $\left\{\oplus_e,\oplus_e\right\}$ one.

The expression such as the experiment is considered by the following.

$$P+\bar{P}+\left\{\left(\pi^{0}\right),\oplus_{e\mu}\right\}$$

or

$$P+\bar{P}+\left\{\left(Z^{0}\right)\right\}$$
$$\to\left\{\left(u,d,d\right),\left(u,\bar{d}\right)\right\}+\left\{\left(\bar{u},\bar{d},\bar{d}\right),\left(\bar{u},d\right)\right\}$$
$$+\left\{\left(\pi^{0}\right),\left(\oplus_{e\mu}\right)\right\}$$
$$\to\left(t+\bar{t}\right)$$
$$\to\left\{\left(u,d,d\right),\left(u,\bar{d}\right),\left(d,\bar{u}\right)\right\}$$
$$+\left\{\left(\left(\bar{u},\bar{d},\bar{d}\right),\left(\bar{u},d\right),\left(\oplus_{e\mu}\right),\left(u,d\right)\right\}$$
$$\to\left(\pi^{+}+b\right)+\left(W_{2}^{-}+\bar{b}\right)$$
$$\to\left\{u,\bar{d}\right\}+\left\{d,\left(u,\bar{d},\bar{u},d\right)\right\}$$
$$+\left\{\bar{u},d,\oplus_{e\mu}\right\}+\left\{\bar{d},\left(u,\bar{d},\bar{u},d\right)\right\}$$
$$\to\left\{u,\bar{d}\right\}+\left\{d,\left(u,\bar{d},\bar{u},d\right)\right\}+\left\{\left(\bar{u},d,\nu_{e},\bar{\nu}_{e},\nu_{\mu}\right),\left(\bar{\nu}_{\mu}\right)\right\}$$
$$+\left\{\bar{d},\left(u,\bar{d},\bar{u},d\right)\right\}$$
$$\to\left(u+\bar{d}+\left\{d,\left(\pi^{0}\right)\right\}\right)+\left(\mu^{-}+\bar{\nu}_{\mu}+\left\{\bar{d},\left(\pi^{0}\right)\right\}\right)$$

The $\left\{\oplus_e,\oplus_\mu\right\}$ pair may be prefered through all reactions than the symmetric experiment with the $\left\{\oplus_e,\oplus_e\right\}$ pair. Those reactions are not a two-body collision.

4.5. Identity of Higgs Boson

The followings show the compositions of some hypothetical Higgs bosons by [11,12].

The light Higgs boson

$$\left(H^{0}\right)_{light}=\left\{\left(b\right),\left(\bar{b}\right)\right\}$$
$$=\left\{\left(d,\left(u,\bar{d},\bar{u},d\right)\right),\left(\bar{d},\left(u,\bar{d},\bar{u},d\right)\right)\right\}$$
$$=\left\{\left(\pi^{0}\right),d,\bar{d},\left(\pi^{0}\right)\right\}$$

The heavy Higgs bosons

$$\left(H^{0}\right)_{heavy(1)}=\left\{\left(W^{+}\right),\left(W^{-}\right)\right\}$$
$$=\left\{u,\bar{d},\oplus_{e}\right\}\left\{\bar{u},d,\oplus_{e}\right\}$$
$$=\left\{\left(\pi^{0}\right),\oplus_{ee}\right\}$$

and

$$\left(H^{0}\right)_{heavy(2)}=\left\{\left(Z^{0}\right),\left(Z^{0}\right)\right\}=\left\{\left(u,\bar{u}\right),\left(K^{0}\right),\left(Z^{0}\right)\right\}$$
$$=\left\{\left(\pi^{0}\right),\left(\pi^{0}\right),\oplus_{e\mu},\oplus_{e\mu}\right\}$$

A neutral pion $\left\{\left(\pi^{0}\right)\right\}$ is the common minimum particle of Higgs boson.

4.6. Identity of Pentaquark Composite Θ^{+}

It was reported on the evidence of pentaquark composite $\left(\Theta^{+}\right)$ by [13].

$$\gamma+n+p+(etc.)\to(composite)$$
$$\to\Theta^{+}\left\{u,u,d,d,\bar{s}\right\}+\left(K^{-}+p\right)+(others)$$
$$\to\left(n+K^{+}\right)+\left(K^{-}+p\right)+(others)$$

4.6.1. Analisys

The composition of pentaquark composite is analized. The following is the new expression.

$$\gamma+\pi^{0}+n+P+(etc.)\to composite\left\{\gamma,\pi^{0},n,P,(etc.)\right\}$$
$$\to\Theta^{+}\left\{u,u,d,d,\left(\bar{s}\right)\right\}+\left(\left(K^{-}+P\right)\right)+(others)$$
$$\to\left(n+K^{+}\right)+\left(K^{-}+P\right)+(others)$$

Next is the simple expression.

$\gamma + \pi^0 + n + P$

$\rightarrow \{(\oplus_{e\mu}, \oplus_{e\mu}), (u, \bar{d}, \bar{u}, d), (u, d, d), ((u, d, d)), (u, \bar{d})\}$

$\rightarrow \Theta^+ \{(u, d, d, u, \bar{d}), (\oplus_{e\mu})\}$

$+ \{\bar{u}, d, \oplus_{e\mu}\} + \{(u, d, d), (u, \bar{d})\}$

$\rightarrow \{u, d, d\} + \{u, \bar{d}, \oplus_{e\mu}\} + \{\bar{u}, d, \oplus_{e\mu}\} + \{(u, d, d), (u, \bar{d})\}$

$\rightarrow (n + K^+) + (K^- + P)$

This pentaquark composite (Θ^+) consists of the energy quanta and the f $^+$ ive members of quark. However this reaction can be also explained with the traditional proton $\{u, u, d\}$.

$\gamma + \pi^0 + n + p$

$\rightarrow \{(\oplus_{e\mu}, \oplus_{e\mu}), (u, \bar{d}, \bar{u}, d), (u, d, d), (u, u, d)\}$

$\rightarrow \Theta^+ \{(u, d, d, u, \bar{d}), (\oplus_{e\mu})\} + \{\bar{u}, d, \oplus_{e\mu}\} + \{(u, u, d)\}$

$\rightarrow \{u, d, d\} + \{u, \bar{d}, \oplus_{e\mu}\} + \{\bar{u}, d, \oplus_{e\mu}\} + \{(u, u, d)\}$

$\rightarrow (n + K^+) + (K^- + p)$

4.7. Identity of the Debated Pentaquark Composite Θ^+

4.7.1. 2005 JLab News Release, Pentaquark Debate Heats Up (April 28)

It was reported that "*Pentaquarks are built of five quarks: for example, the* Θ^+ *is built of two up quarks, two down quarks and an anti-strange quark.*" by [14].

$$p + \gamma \rightarrow \Theta^+ + \bar{K}^0 \rightarrow (K^+ + n) + (\pi^+ + \pi^-)$$

4.7.2. Results of Analysis

The composition of Θ^+ composite is analized. The proton decays with a neutral pion $\{\pi^0\}$ and some gamma-rays by a law of conservation of number of particle. It is shown that the Θ^+ compositions are $\{u, d, d, u, \bar{d}, \oplus_{e\mu}\}$. It is an exotic composite.

$$P + \gamma + \pi^0 + \gamma \text{ or } P + \gamma$$

$= P + \{\oplus_{e\mu}\} + \pi^0 + \{\oplus_{e\mu}\}$ or $= P + \{\oplus_{e\mu}\} + Z^0$

$= \{(P), \oplus_{e\mu}\} + \{(\pi^0), \oplus_{e\mu}\}$

$\rightarrow \Theta^+ \{(P), \oplus_{e\mu}\} + \{\oplus_u, (\bar{K}^0)\}$

$(\rightarrow \Theta^+ \{(n), (\pi^+), \oplus_{e\mu}\} + Z^0)$

$\rightarrow \Theta^+ \{(\pi^+, \oplus_{e\mu}), (n)\} + \{(\pi^0), \oplus_{e\mu}\}$

$\rightarrow (K^+ + n) + (\pi^+ + \pi^-) + \{\oplus_{e\mu}\}$

$(n) = \{u, d, d\}$

$(P) = \{(u, d, d), (u, \bar{d})\}$

$(\pi^+) = \{u, \bar{d}\}$

$(\pi^-) = \{\bar{u}, d\}$

$(\pi^0) = \{u, \bar{d}, \bar{u}, d\}$

$(\bar{s}) = \{\bar{d}, \oplus_{e\mu}\}$

$(K^+) = \{(u, \bar{d}), \oplus_{e\mu}\} = \{(\pi^+), \oplus_{e\mu}\}$

$(\bar{K}^0) = \{(d, \bar{d}), \oplus_{e\mu}\} = \{d, (\bar{s})\} = \{d, (\bar{d}, \oplus_{e\mu})\}$

4.7.3. Details of Analysis

$\gamma + P \rightarrow \Theta^+ + \bar{K}^0 \rightarrow (K^+ + n) + (\pi^+ + \pi^-)$

$\rightarrow \{u, \bar{d}, \oplus_{e\mu}\} + \{u, d, d\} + \{u, \bar{d}\} + \{\bar{u}, d\}$

$\rightarrow \{u, \bar{d}, \oplus_{e\mu}\} + \{u, d, d\} + \{u, \bar{d}\} + \{\bar{u}, d\} + \{etc\}$

The $\{u, \bar{d}\} + \{\bar{u}, d\} + \{etc\}$ must have the components of $\bar{K}^0$ $(= \{d, \bar{d}, \oplus_{e\mu}\})$. The $\{etc\}$ is $\{\oplus_{e\mu}\}$.

$\rightarrow \{(u, \bar{d}), \oplus_{e\mu}\} + \{u, d, d\} + \{u, \bar{d}\} + \{\bar{u}, d\} + \{\oplus_{e\mu}\}$

$\rightarrow \{(u, \bar{d}), \oplus_{e\mu}, (u, d, d)\} + \{(u, \bar{d}), (\bar{u}, d), \oplus_{e\mu}\}$

$\rightarrow \{(u, \bar{d}), (u, d, d), \oplus_{e\mu}\} + \{(u, \bar{d}, \bar{u}, d), \oplus_{e\mu}\}$

$\rightarrow \Theta^+ \{(P), \oplus_{e\mu}\} + \{(\pi^0), \oplus_{e\mu}\}$ or $\Theta^+ \{(P), \oplus_{e\mu}\} + Z^0$

$\rightarrow P + \{\oplus_{e\mu}\} + \pi^0 + \{\oplus_{e\mu}\} \rightarrow P + \gamma + \pi^0 + \gamma$

(If π^0 is a kind of γ) $\cdots P + \gamma$

4.7.4. Analized Description

$\gamma + P + \pi^0 + \gamma$

$\{(P)\} + \{\oplus_{e\mu}\} + \{(\pi^0)\} + \{\oplus_{e\mu}\}$

$\rightarrow \Theta^+ (= \{(P), \oplus_{e\mu}\}) + \{(\pi^0), \oplus_{e\mu}\}$

or $= \{(n), (\pi^+), \oplus_{e\mu}\} + \{(Z^0)\}$

$\cdots = \{(n), (K^+)\} + \{(Z^0)\}$

$\cdots = \{(\Lambda^0)(\pi^+)\} + \{(Z^0)\}$

$\rightarrow \Theta^+ \{(P), \oplus_{e\mu}\} + \{(u, \bar{u}), (\bar{K}^0)\}$

$\rightarrow \{(u, d, d), (u, \bar{d}), \oplus_{e\mu}\} + \{u, \bar{d}, \bar{u}, d, \oplus_{e\mu}\}$

$\rightarrow \{(u, \bar{d}), \oplus_{e\mu}, (u, d, d)\} + \{(u, \bar{d}), (\bar{u}, d), \oplus_{e\mu}\}$

$\rightarrow \{(u, \bar{d}), \oplus_{e\mu}\} + \{u, d, d\} + \{u, \bar{d}\} + \{\bar{u}, d\} + \{\oplus_{e\mu}\}$

The Θ^+ composite consists of the newly defined proton and the energy quanta. This reaction cannot be explained with the traditional proton $\{u,u,d\}$.

4.8. Identity of the B Composites $\left(B/B^-\right)$

4.8.1. On "Enhanced CP Violation with $B \to KD^0\left(\overline{D}^0\right)$ Modes and Extraction of the Cabibbo-Kobayashi-Maskawa Angle γ [15]"

The B decay and the quark expression are as follows.

$$B \to \left\{\left(\overline{D}^0\right)\right\} + \left\{\left(\pi^0\right)\right\}$$

$$\to \left\{\left(\overline{D}^0\right)\right\} + \left\{\left(K^+\right)\right\} + \left\{\left(\pi^-\right),\left(\pi^+\right),\left(\pi^-\right)\right\}\left\{b,\overline{b},u,\overline{u}\right\}$$

$$\to \left\{\overline{c},u\right\} + \left\{u,\overline{u},d,\overline{d}\right\} \to \left\{\overline{c},u\right\} + \left\{u,\overline{d},\oplus_{e\mu}\right\}$$

$$+\left\{\left(\pi^-\right),\left(\pi^+\right),\left(\pi^-\right)\right\}\left\{\left(d,\pi^0\right),\overline{u},\left(\overline{d},\pi^0\right),u\right\}$$

$$\to \left\{\overline{d},\oplus_{e\mu},\overline{u},d,u\right\} + \left\{u,\overline{d},\oplus_{e\mu}\right\} + \left\{\left(\pi^-\right),\left(\pi^+\right),\left(\pi^-\right)\right\}$$

The undetected energies are missing. Next expression is complete.

$$\left\{\left(d,\pi^0\right),\overline{u},\left(\overline{d},\pi^0\right),u\right\} + \oplus_{e\mu} + \oplus_{e\mu}$$

$$\to \left\{\overline{d},\oplus_{e\mu},\overline{u},d,u\right\} + \left\{u,\overline{d},\oplus_{e\mu}\right\}$$

$$+\left\{\left(\pi^-\right),\left(\pi^+\right),\left(\pi^-\right)\right\}\left\{b,\overline{b},u,\overline{u}\right\} + \oplus_{e\mu} + \oplus_{e\mu}$$

$$\to \left\{\overline{c},u\right\} + \oplus_{e\mu} + \left\{u,\overline{u},d,\overline{d}\right\} + \left\{u,\overline{u},d,\overline{d}\right\}$$

$$\to \left\{\overline{c},u\right\} + \left\{u,\overline{d},\oplus_{e\mu}\right\} + \left\{\left(\pi^-\right),\left(\pi^+\right),\left(\pi^-\right)\right\}$$

$$B + \oplus_{e\mu} + \oplus_{e\mu} \to \left\{(\overline{D}^0)\right\} + \oplus_{e\mu} + \left\{\pi^0\right\} + \left\{\pi^0\right\}$$

$$\to \left\{\left(\overline{D}^0\right) + \left(K^+\right)\right\} + \left\{\left(\pi^-\right),\left(\pi^+\right),\left(\pi^-\right)\right\}$$

$$\left(B\right) = \left\{\left(d,\pi^0\right),\overline{u},\left(\overline{d},\pi^0\right),u\right\} = \left\{\left(\pi^0\right),\left(\pi^0\right),\left(\pi^0\right)\right\}$$

$$\left(K^+\right) = \left\{\left(u,\overline{d}\right),\oplus_{e\mu}\right\} = \left\{\left(\pi^+\right),\oplus_{e\mu}\right\}$$

$$\left(\overline{D}^0\right) = \left\{\left(\overline{c}\right),u\right\} ref16 = \left\{\left(\overline{s},\overline{u},d\right),u\right\}$$

$$= \left\{\left(\overline{d},\oplus_{e\mu},\overline{u},d\right),u\right\} = \left\{\left(c\right),\overline{u}\right\} = \left(D^0\right)$$

$$\left(b\right) = \left\{d,\left(\pi^0\right)\right\} = \left\{d,(\left(u,\overline{u},d,\overline{d}\right)\right\}$$

$$\left(\overline{b}\right) = \left\{\overline{d},\left(\pi^0\right)\right\} = \left\{\overline{d},\left(u,\overline{u},d,\overline{d}\right)\right\}$$

$$\left(c\right) = \left\{\left(s\right),\left(\pi^+\right)\right\} = \left\{\left(s\right),\left(u,\overline{d}\right)\right\}$$

$$\left(\overline{c}\right) = \left\{\overline{s},\left(\pi^-\right)\right\} = \left\{\overline{s},(\left(\overline{u},d\right)\right\}$$

$$\left(s\right) = \left\{d,\oplus_{e\mu}\right\} \qquad \left(\overline{s}\right) = \left\{\overline{d},\oplus_{e\mu}\right\}$$

4.8.2. On "First Evidence of the Decay $B^- \to DK^-$ Followed by $D \to K^+ \& \pi^-$ (2010)"

Two B^- decays and the quark expressions are as follows [17].

(First)

$$\left\{\left(B^-\right)\right\} \to \left\{\left(D^0\right)\right\} + \left\{\left(W^-\right)\right\} \to \left\{\left(D^0\right)\right\} + \left\{\left(K^-\right)\right\}$$

$$\left\{\left(b\right)),\overline{u}\right\} \to \left\{\left(c\right),\overline{u}\right\} + \left\{\overline{u},d,\oplus_e\right\} \to \left\{\left(c\right),\overline{u}\right\} + \left\{\overline{u},d,\oplus_{e\mu}\right\}$$

$$\left\{d,\pi^0,\overline{u}\right\} \to \left\{d,\oplus_{e\mu},u,\overline{d},\overline{u}\right\} + \left\{\overline{u},d,\oplus_{e\mu}\right\}$$

The quark expression is uncomplete. It seems that the undetected energy is missing. Next expression is complete.

$$\left\{d,\left(\pi^0\right),\overline{u},\oplus_{e\mu},\oplus_{e\mu}\right\}$$

$$\to \left\{d,\oplus_{e\mu},u,\overline{d},\overline{u}\right\} + \left\{\oplus_\mu\right\} + \left\{\overline{u},d,\oplus_e\right\}$$

$$\to \left\{d,\oplus_{e\mu},u,\overline{d},\overline{u}\right\} + \left\{\overline{u},d,\oplus_{e\mu}\right\}$$

$$\left\{\left(B^-\right)\right\} + \left\{\oplus_{e\mu}\right\} + \left\{\oplus_{e\mu}\right\} \to \left\{\left(D^0\right)\right\} + \left\{\oplus_\mu\right\} + \left\{\left(W^-\right)\right\}$$

$$\to \left\{\left(D^0\right)\right\} + \left\{\left(K^-\right)\right\}$$

(Second)

$$\{(\left(B^-\right))\} \to \{u\} + \{(\left(W^-\right))\} + \{\overline{u}\}$$

$$\to \left\{\left(D^0\right)\right\} + \left\{\left(K^-\right)\right\}$$

$$\left\{\left(b\right),\overline{u}\right\} \to \{u\} + \{\overline{u},d,\oplus_e\} + \{\overline{u}\}$$

$$\to \left\{\left(\overline{c}\right),u\right\} + \left\{\left(s\right),\overline{u}\right\}$$

$$\left\{d,\left(\pi^0\right),\overline{u}\right\} \to \{u\} + \{\overline{u},d,\oplus_e\} + \{\overline{u}\}$$

$$\to \left\{\left(\overline{d},\oplus_{e\mu},\overline{u},d\right),u\right\} + \left\{d,\oplus_{e\mu},\overline{u}\right\}$$

The undetected energies and $\left\{d,\overline{d}\right\}$ are missing. Next expression is complete.

$$\left\{d,\left(\pi^0\right),\overline{u}\right\} + \left\{\oplus_{e\mu}\right\} + \left\{\oplus_{e\mu}\right\}$$

$$\to \{u\} + \left\{d,\overline{d}\right\} + \left\{\oplus_{e\mu}\right\} + \left\{\oplus_\mu\right\} + \{\overline{u},d,\oplus_e\} + \{\overline{u}\}$$

$$\to \left\{\left(\overline{d},\oplus_{e\mu},\overline{u},d\right),u\right\} + \left\{d,\oplus_{e\mu},\overline{u}\right\}$$

$$\left\{\left(b\right),\overline{u}\right\} + \left\{\oplus_{e\mu}\right\} + \left\{\oplus_{e\mu}\right\}$$

$$\to \{u\} + \left\{d,\overline{d}\right\} + \left\{\oplus_{e\mu}\right\} + \left\{\oplus_\mu\right\} + \{\overline{u},d,\oplus_e\} + \{\overline{u}\}$$

$$\to \left\{\overline{c},u\right\} + \left\{\left(s\right),\overline{u}\right\}$$

$$\left\{\left(B^-\right)\right\} + \left\{\oplus_{e\mu}\right\} + \left\{\oplus_{e\mu}\right\}$$

$$\to \{u\} + \left\{d,\overline{d}\right\} + \left\{\oplus_{e\mu}\right\} + \left\{\oplus_\mu\right\} + \left\{\left(W^-\right)\right\} + \{\overline{u}\}$$

$$\to \left\{\left(D^0\right)\right\} + \left\{\left(K^-\right)\right\}$$

$$\left(B^{-}\right)=\left\{d,\left(\pi^{0}\right),\bar{u}\right\}=\left\{\left(\pi^{-}\right),\left(\pi^{0}\right)\right\}$$

5. Summary

The fundamental particles are expected to be up quark $\{u\}$, down quark $\{d\}$, neutrino $\{\nu_e\}$, muon-neutrino $\{\nu_\mu\}$, and those anti-particles. The difference between neutrino and muon-neutrino is their kinetic energies.

The leptons of electron, positron, and energy quanta have the subatomic structure.

$$\left(e^{+}\right)=\left\{u,\bar{d},\bar{\nu}_e\right\}$$
$$\left(e^{-}\right)=\left\{\bar{u},d,\nu_e\right\}$$
$$\oplus_u=\left\{u,\bar{u}\right\}$$
$$\oplus_d=\left\{d,\bar{d}\right\}$$
$$\oplus_e=\left\{\nu_e,\bar{\nu}_e\right\}$$
$$\oplus_\mu=\left\{\nu_\mu,\bar{\nu}_\mu\right\}$$

The members of charged muons, μ^{+}/μ^{-}, were shown.

$$\left(\mu^{+}\right)=\left\{u,\bar{d},\nu_e,\bar{\nu}_e\bar{\nu}_\mu\right\}=\left\{\left(\pi^{+}\right)\right\}\left\{\oplus_e\right\}\left\{\bar{\nu}_\mu\right\}$$
$$\left(\mu^{-}\right)=\left\{\bar{u},d,\nu_e,\bar{\nu}_e\right\},\nu_\mu=\left\{\left(\pi^{-}\right)\right\}\left\{\oplus_e\right\}\left\{\nu_\mu\right\}$$

The members of $W^{+}/W^{-}/Z^{0}$ bosons and the minimum member of Higgs boson were shown.

$$\left(W^{+}\right)=\left\{u,\bar{d},\nu_e,\bar{\nu}_e\right\}=\left\{\left(\pi^{+}\right)\right\}\left\{\oplus_e\right\}$$
$$\left(W^{-}\right)=\left\{\bar{u},d,\nu_e,\bar{\nu}_e\right\}=\left\{\left(\pi^{-}\right)\right\}\left\{\oplus_e\right\}$$
$$\left(Z^{0}\right)_1=\left\{u,\bar{u},d,\bar{d},\nu_e,\bar{\nu}_e,\nu_\mu,\bar{\nu}_\mu\right\}=\left\{\left(\pi^{0}\right)\right\}\left\{\oplus_{e\mu}\right\}$$
$$\left(Z^{0}\right)_2=\left\{u,\bar{u},d,\bar{d},\nu_e,\bar{\nu}_e,\nu_e,\bar{\nu}_e\right\}=\left\{\left(\pi^{0}\right)\right\}\left\{\oplus_{ee}\right\}$$
$$minimum\left(H^{0}\right)=\left\{u,\bar{u},d,\bar{d}\right\}=\left\{\left(\pi^{0}\right)\right\}$$

The members of $K^{+}/K^{-}/K^{0}/K_s/\Lambda^{0}/\Theta^{+}/B/B^{-}$ composites were shown.

$$\left(K^{+}\right)=\left\{u,\left(\bar{s}\right)\right\}=\left\{u,\left(\bar{d},\oplus_{e\mu}\right)\right\}$$
$$=\left\{\left(u,\bar{d}\right),\oplus_{e\mu}\right\}=\left\{\left(\pi^{+}\right),\oplus_{e\mu}\right\}$$
$$\left(K^{-}\right)=\left\{\bar{u},\left(s\right)\right\}=\left\{\bar{u},\left(d,\oplus_{e\mu}\right)\right\}$$
$$=\left\{\left(\bar{u},d\right),\oplus_{e\mu}\right\}=\left\{\left(\pi^{-}\right),\oplus_{e\mu}\right\}$$
$$\left(K^{0}\right)=\left\{d,\left(\bar{s}\right)\right\}=\left\{d,\bar{d},\oplus_{e\mu}\right\}=\left\{\oplus_d,\oplus_{e\mu}\right\}$$
$$\left(\bar{K}^{0}\right)=\left\{\bar{d},\left(s\right)\right\}=\left\{\bar{d},d,\oplus_{e\mu}\right\}=\left\{\oplus_d,\oplus_{e\mu}\right\}=\left(K^{0}\right)$$
$$\left(K_s\right)=\left\{d,\left(\bar{s}\right),\left(s\right),\bar{d}\right\}=\left\{d,\left(\bar{d},\oplus_{e\mu}\right),\left(d,\oplus_{e\mu}\right),\bar{d}\right\}$$
$$\left(\Lambda^{0}\right)=\left\{u,d,\left(d,\oplus_{e\mu}\right)\right\}$$
$$=\left\{\left(u,d,d\right),\left(\oplus_{e\mu}\right)\right\}=\left\{\left(n\right),\left(\oplus_{e\mu}\right)\right\}$$
$$\left(\Lambda_b^{0}\right)=\left\{\left(u,d,d\right),\left(u,\bar{u},d,\bar{d}\right)\right\}=\left\{\left(n\right),\left(\pi^{0}\right)\right\}$$
$$\left(\Theta^{+}\right)=\left\{\left(u,d,d,u,\bar{d}\right),\left(\oplus_{e\mu}\right)\right\}=\left\{\left(P\right),\left(\oplus_{e\mu}\right)\right\}$$
$$\left(B\right)=\left\{\left(d,\pi^{0}\right),\bar{u},\left(\bar{d},\pi^{0}\right),u\right\}=\left\{\left(\pi^{0}\right),\left(\pi^{0}\right),\left(\pi^{0}\right)\right\}$$
$$\left(B^{-}\right)=\left\{d,\left(\pi^{0}\right),\bar{u}\right\}=\left\{\left(\pi^{-}\right),\left(\pi^{0}\right)\right\}$$

The second and third quark no longer say quark. They are the exotic second and third states of the first generation's quark composites.

$$\left(s\right)=\left\{d,\nu_e,\bar{\nu}_e,\nu_\mu,\bar{\nu}_\mu\right\}=\left\{d,\oplus_{e\mu}\right\}$$
$$\left(c\right)=\left\{\left(s\right),\left(u,\bar{d}\right)\right\}=\left\{\left(s\right),\left(\pi^{+}\right)\right\}$$
$$=\left\{\left(d,\oplus_{e\mu}\right),\left(u,\bar{d}\right)\right\}=\left\{\left(d,\oplus_{e\mu}\right),\left(\pi^{+}\right)\right\}=\left\{d,\left(K^{+}\right)\right\}$$
$$=\left\{u,\left(d,\bar{d},\oplus_{e\mu}\right)\right\}=\left\{u,\left(\oplus_d,\oplus_{e\mu}\right)\right\}=\left\{u,\left(K^{0}\right)\right\}$$
$$\left(b\right)=\left\{d,\left(u,\bar{d},\bar{u},d\right)\right\}=\left\{d,\left(\pi^{0}\right)\right\}$$
$$\left\{\left(t\right),\left(\bar{t}\right)\right\}_1$$
$$=\left\{\left(u,d,d\right),\left(u,\bar{d}\right),\left(\bar{u},\bar{d},\bar{d}\right),\left(\bar{u},d\right),\left(\pi^{0}\right),\left(\oplus_{ee}\right)\right\}$$
$$\left\{\left(t\right),\left(\bar{t}\right)\right\}_2$$
$$=\left\{\left(u,d,d\right),\left(u,\bar{d}\right),\left(\bar{u},\bar{d},\bar{d}\right),\left(\bar{u},d\right),\left(\pi^{0}\right),\left(\oplus_{e\mu}\right)\right\}$$

The proton might be a pentaquark.

$$\left(P\right)=\left\{\left(u,u,d\right),\left(d,\bar{d}\right)\right\}$$
$$\rightleftharpoons\left\{\left(u,d,d,u,\bar{d}\right)\right\}$$
$$\rightleftharpoons\left\{\left(u,d,d\right),\left(u,\bar{d}\right)\right\}$$

6. Acknowledgement

I thank you for great accomplishment for mankind. May peace be upon all living things forever and ever.

I thank my dead father for this study. All the inheritance from him helped me.

7. References

[1] Ryden, B. (2003) Introduction to Cosmology, 1st edition, Japanese language edition, (Pearson Education, Inc.), Chapter 10.

[2] M. Gell-Mann, "A Schematic Model of Baryons and Mesons," Physics Letters Vol 8, 1964, PP. 214-215.

[3] Zweig, G. (1964) "AN SU_3 MODEL FOR STRONG

INTERACTION SYMMETRY AND ITS BREAKING I," CERN Reports 8182/TH.401 and "AN SU_3 MODEL FOR STRONG INTERACTION SYMMETRY AND ITS BREAKING II 8419/TH.412"

[4] Hamatsu, R. (1990) High Energy Physics of physics lecture course, Tokyo Metropolitan University.

[5] A. Kernan, W. M. Powell, C. L. Sandler, W.L. Knight, and F. Russell Stannard, "Muonic-Decay Branching Ratio of the Lambda Hyperon," Phys. Rev. Vol 133, 1964, B1271-B1273.

[6] Yuksel, H, (2006) "Positron Annihilations at the Galactic Center: Generating More Questions Than Answers," arXiv:astro-ph/0609139v1.

[7] W. M. Yao et al. (Particle Data Group), "Review of Particle Physics," J. Phys. G Vol 33, 2006, PP. 1-1232. and 2007 partial update for edition 2008, http://pdg.lbl.gov/

[8] A. F. Falk, A Lewandowski, A.A. Petrov, "Effects from the charm scale in $K^+ \to \pi + v^- v$," Phys. Lett. B Vol 505, 2001, PP. 107-112.

[9] J.-E. Augustin et al., "Discovery of a Narrow Resonance in e^+e^- Annihilation," Phys. Rev. Lett. Vol 33, 1974, PP. 1406-1408.

[10] F. Abe et al., "Identification of top quarks using kinematic variables," Phys. Rev. D Vol 52, 1995, PP. R2605-R2609.

[11] P. Igo-Kemenes, "Searches for Higgs bosons at LEP2," J. Phys. G: Nucl. Part. Phys. Vol 24, 1998, PP. 325-335 and Updated October 2005 by P. Igo-Kemenes.

[12] P.W. Higgs, "Broken Symmetries and the Masses of Gauge Bosons," Phys. Rev. Lett. Vol 13, 1964, PP. 508-509.

[13] T. Nakano et al., "Evidence for a Narrow S = + 1 Baryon Resonance in Photoproduction from the Neutron," Phys. Rev. Lett. Vol 91, 2003, PP. 012002.

[14] JLAB News Release, (2005) Pentaquark debate heats up, http://www.jlab.org/divdept/diro/publicaairs/newsreleases/2005/pentaquarks.html

[15] D. Atwood, I. Dunietz, and A. Soni, "Enhanced CP Violation with $B \to KD^0(\bar{D}^0)$ Modes and Extraction of the Cabibbo-Kobayashi-Maskawa Angle γ," Phys. Rev. Lett. Vol 78, 1997, PP. 3257-3260.

[16] S. Eidelman, et al., "Charm Dalitz Plot Analysis Formalism and Results," Phys. Lett. B Vol 592, 2004, PP. 1-1109.

[17] Horii, Y, et al., (2010) First Evidence of the Decay $B^- \to DK^-$ Followed by $D \to K^+ \& \pi^-$, http://belle.kek.jp/results/summer10/dk_ads/.