Quantized space-time and internal Structure of Elementary particles: A new model

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Abstract: In this paper we present a model in which the time and length are considered quantized. We try to explain the internal structure of the elementary particles in a new way. In this model a super-dimension is defined to separate the beginning and the end of each time and length quanta from another time and length quanta. The beginning and the end of the dimension of the elementary particles are located in this super-dimension. This model can describe the basic concepts of inertial mass and internal energy of the Elementary particles in a better way. By applying this model, some basic calculations mentioned below, can be done in a new way:

1- The charge of elementary particles such as electrons and protons can be calculated theoretically. This quantity has been measured experimentally up to now.

2- By using the equation of the particle charge obtained in this model, the energy of the different layers of atoms such as hydrogen and helium is calculated. This approach is simpler than using Schrödinger equation.

3- Calculation of maximum speed of particles such as electrons and positrons in the accelerators is given.

1- Introduction

First axiom: The minimum possible length not separable to smaller lengths and that still contains motion is equal to,

$$l_0 : \text{Length quanta} = 1.409 \times 10^{-15} m .$$

The minimum possible time beyond which there is no smaller time interval is equal to,

$$\Delta T_0 : \text{Time quanta} = \frac{l_0}{c} = 0.47 \times 10^{-23} \qquad (1)$$

Where c = *299,792,458*[1] m/s is the speed of light. [1]

Key words: Length quanta, Time quanta, Charge of electron, Charge of proton, neutrino, Lepton

Second axiom: A super-dimension separates the beginning and the end of each quanta. Inside particles with inertial mass, there is a particle which I call moton and it has two speed of light simultaneously. The moton moves in the present time and length quanta as well as in the past time and length quanta. An anti-moton has a motion in the present time and length quanta and a motion in the future time and length quanta. Dimensions are penetrating and are created from super–dimension sequentially. In massless particles, the motion is only in present time and length quanta.

The first axiom is determined by considering the minimum wavelength of gamma radiation [1] and the minimum of the life time of the elementary particles is the life time of the vector particles [3].which is three orders of magnitude bigger than the minimum measured wavelength of electrons in an accelerator, $\lambda = 10^{-18} m$ [1]. This contradiction is due to the wrong derivation of electron wavelength obtained from the following equation,

$$E = W = q \times V , \tag{2}$$

Where, *E*, *W*, *q* and *V* are the energy of the particle in an accelerator, work done on the particle, charge of the particle and voltage applied on the particle respectively.
In Equation 2, the presentation of the particle charge is not correct and we would present the correct equation of chargh in continue. The correct form of the particle energy is given in this equation:

[4] $$E = \sqrt{(p^2 m^2 \ + m^2 c^4)} , \tag{3}$$

Where *p* is the momentum of the particle and *m* is the mass. Equation 3 should be used for calculating the energy of the particles in accelerators. The second contradiction is that the values given for the length and time quanta in equation 1 are much bigger than the Planck length and time [2],

$$\ell_p = \sqrt{\frac{\hbar G}{c^3}} = 1.616252 \times 10^{-35} m$$
$$t_p = \frac{l_p}{c} = 5.39124 \times 10^{-44} s . \tag{4}$$

We should note that gravity is used in the calculation of Planck time and length. In our model we can ignore the gravity force since the mass of the

subatomic particles used in our model such as electrons ($m_e = 9.109 \times 10^{-31} kg$) is much smaller than the Planck mass ($m_p = \sqrt{\frac{\hbar c}{G}} = 2.176 \times 10^{-8} kg$). [2]
In a black holes, due to gravity, the length and time quanta become smaller and smaller. This reduction in the quanta of length and time is proportional to the mass density of the black hole. As the mass density increases, these quantities penetrate into the super dimension and become comparable to Planck length and time. This is one of the fundamental properties of super-dimension and has been used in derivation of equations for high mass density particles in general.
Using the assumption that time and length are quantized; we might face the question why the velocity of a particle relative to a reference inertial frame isn't quantized? The answer is that we first assume some abstract values for the length and time, and then we place the particle in the system. This is not correct because the particle interacts with the environment and the dimensions of its inner particle motion (moton) change. The elementary particle adjusts the dimensions of its relative motion according to the change in the dimensions of its inner motion. The inner motion dimensions (length and time quanta) are continuously changing, therefore the relative velocity of the particle with respect to an inertial frame of reference changes continuously and is not quantized.
Using the two axioms, we consider length and time quanta as vectors in our model and we present a new definition for mass and energy. We will show that the internal mass and energy of particles are made of time and length quanta. Therefore the mass and energy are vectors with two dimensions. We present the dimensions in a matrix form. Moton is created from a super-dimension and the matrix represents its dimensions. After a time and length quanta passage, it will penetrate into the super-dimension. This process continues as long as the particle exists. The particle is made of all these matrices and consequent super-dimensions. For example the dimensional matrix of an electron with positive spin is given by:

$$\begin{pmatrix} \overrightarrow{\Delta T_1} & \vec{l_1} & \overrightarrow{m_1} \\ \overrightarrow{\Delta T_2} & \vec{l_2} & \overrightarrow{E_1} \end{pmatrix} \xrightarrow{\overline{S_{e1}}} \begin{pmatrix} \overrightarrow{\Delta T_2} & \vec{l_2} & \overrightarrow{m_2} \\ \overrightarrow{\Delta T_3} & \vec{l_3} & \overrightarrow{E_2} \end{pmatrix} \xrightarrow{\overline{S_{e2}}}, \ldots \begin{pmatrix} \overrightarrow{\Delta T_{m-1}} & \overrightarrow{l_{m-1}} & \overrightarrow{m_{m-1}} \\ \overrightarrow{\Delta T_m} & \vec{l_m} & \overrightarrow{E_{m-1}} \end{pmatrix}. \quad (5)$$

Here $\vec{l}$, $\vec{m}$, $\vec{E}$ are length, mass, energy of moton during time $\overrightarrow{\Delta T}$, and $\vec{S}$ is the super-dimension. Number of motons in other elementary particles (anti-particles) is equal to the ratio of their mass to electron (positron) mass. In this model we can assume a mass for nutrinos which is much smaller than electron mass. The dimensional matrix of neutrinos is similar to the electron's and positron's. The charge of the elementary particles can be obtained from the above matrices. Using this charge and by quantizing the space, we can calculate the energy of hydrogen and helium atomic layers. This is an easier way to calculate this energy rather than using Schrödinger equation.

2- **Super- dimension structure:**

Matter in this world consists of two parts. The first part contains time, length, energy and mass and the second part contains a super-dimension in which all the material data (time, length, energy and mass) is stored. Each measurable particle has time, location and motion. The Super-dimension $\vec{S}_n$ in particles with mass consists of time, length, energy and mass at the beginning and end of both motions (second axiom). Massless particles like photons contain only one present time and length quanta. They are created from a super-dimension and they penetrate into it and this process continues.

The transition of a moton from S_{on}(end of each quanta) to S_n(beginning of each quanta) is done without any passing of sensible time and length. This transition is done under the super-dimension $\overrightarrow{S_n}$. The length quanta $(\vec{l_1}, \vec{l_2}, ..., \vec{l_m})$ and the time quanta $(\overrightarrow{\Delta T_1}, \overrightarrow{\Delta T_2}, ..., \overrightarrow{\Delta T_m})$ are created sequentially by super-dimension $\overrightarrow{S_n} = \left(\overrightarrow{S_1} \quad \overrightarrow{S_2} \quad ... \quad \overrightarrow{S_m}\right)$. Following figures shows the creation of time and length quanta from super-dimension and penetrating them in the super-dimension.

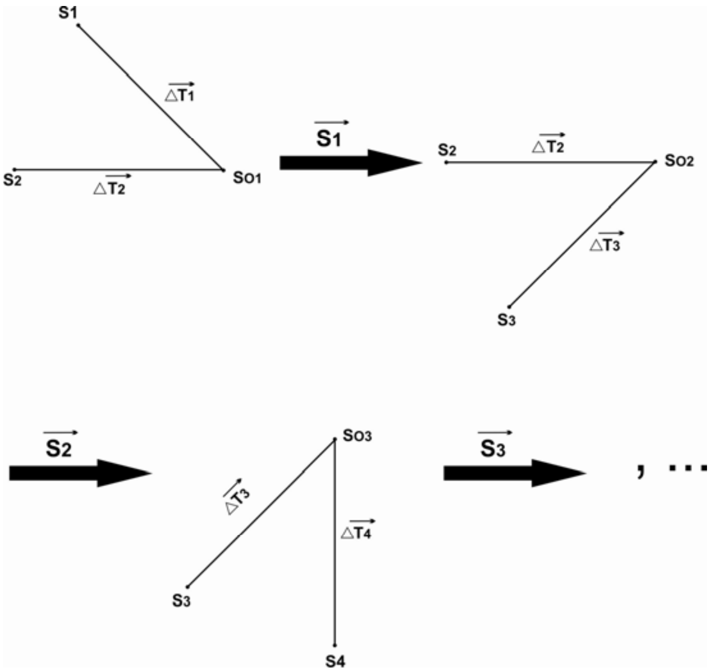

Fig. 1. The sequence of time quanta of the electron

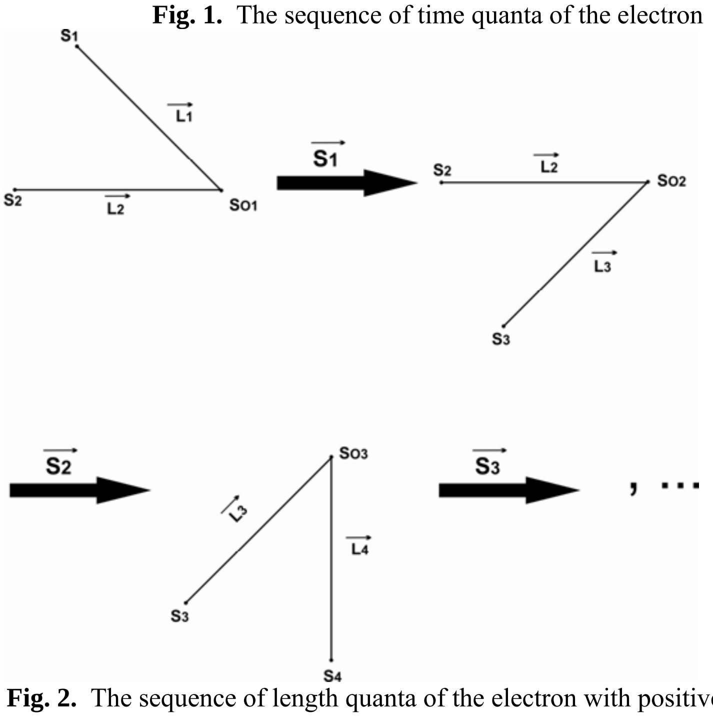

Fig. 2. The sequence of length quanta of the electron with positive spin

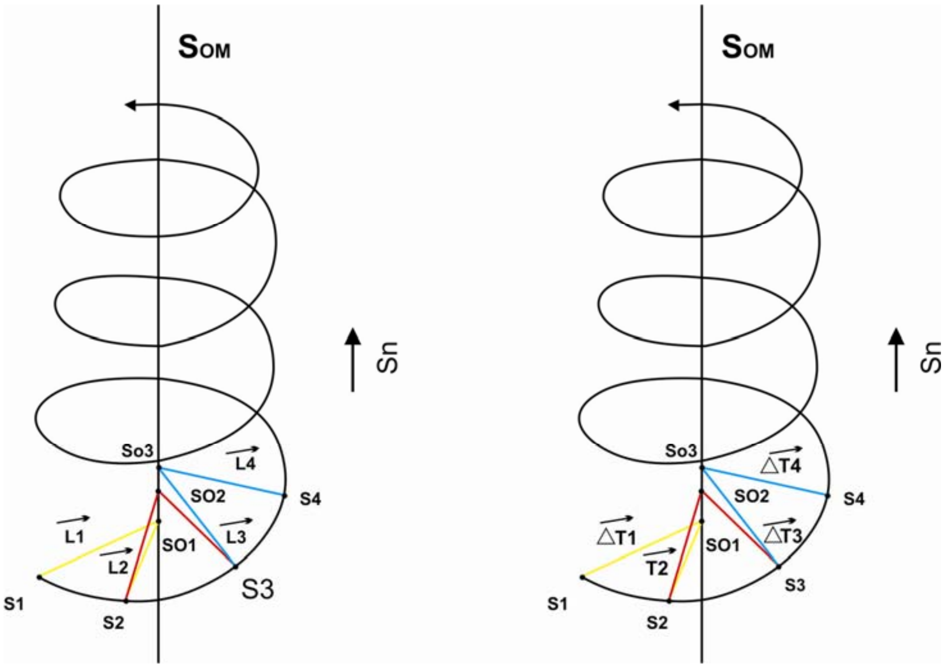

Fig. 3. The sequence of time and length of an electron in super-dimension $\overrightarrow{S_n}$. The electron has positive spin angular momentum with a relative zero velocity with respect to a local frame

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3_Definition:

3-1) the inertial mass of the elementary particles: The motion of a moton in the past and present time quanta causes the time surrounding a particle to bend and creates a time surface around the particle which is proportional to its inertial mass. This time surface defines the location of the particle in figure 3. The inertial mass of the elementary particle is proportional to the cross product of $\Delta T_{n\text{-}1}$ and ΔT_n:

$$\vec{m} \propto \overrightarrow{\Delta T_{n-1}} \times \overrightarrow{\Delta T_n} \qquad (6)$$

Where $\vec{m}$ is the inertial mass and $\overrightarrow{\Delta T_{n-1}}$ and $\overrightarrow{\Delta T_n}$ are two time quanta that happen one after another. The inertial mass of the anti-particle is proportional to:

$$\overrightarrow{m^+} \propto \overrightarrow{\Delta T_{n+1}} \times \overrightarrow{\Delta T_n} \qquad (7)$$

Where $\overrightarrow{m^+}$ is the inertial mass of the anti-particle? The angle between the two time quanta indicates the relative displacement and location of the particle in the time diagram (Figure 3). According to the symmetry principle, the angle between the two time quanta vectors is 45°. This results in the electron mass of:

$$\left|\overrightarrow{m^-}\right| = X.\frac{c^2}{\pi}\cdot\left|\overrightarrow{\Delta T_{n-1}}\right|.\left|\overrightarrow{\Delta T_n}\right|\cdot Sin45^\circ . \qquad (8)$$

Here X is a constant which will be calculated later by including gravity in the model. The inertial mass of positron is:

$$\left|\overrightarrow{m^+}\right| = X\cdot\frac{c^2}{\pi}\cdot\left|\overrightarrow{\Delta T_{n+1}}\right|.\left|\overrightarrow{\Delta T_n}\right|\cdot\left|Sin-45^\circ\right| \qquad (9)$$

3-2) we can divide two vectors just when they are nonzero, parallel, are in the same direction and increments of their changes are inverse. Therefore their division gives a unit vector. For example the length quanta vector divided by time quanta vector results in the unit vector of speed of light.

3-3) The inertial energy of an elementary particle is equal to the product of the momentum of a moton in the past time and length quanta, times the momentum of a moton in the present time and length quanta:

$$\vec{E} = \vec{m}\left(\frac{\vec{l}_{n-1}}{\Delta\vec{T}_{n-1}} \times \frac{\vec{l}_n}{\Delta\vec{T}_n}\right), \qquad (10)$$

Where $\vec{E}$ is the internal energy? This energy and motion causes length around the particle to bend.

3-4) we can find the relative velocity of a particle with respect to a reference frame using Figures 1, 2 and 3:

$$\vec{V}^2 = \left(\frac{\vec{l}_{1(so1)}}{\Delta\vec{T}_{(so1)}} \times \frac{\vec{l}_{2(so1)}}{\Delta\vec{T}_{2(so1)}}\right) - \left(\frac{\vec{l}_{2(so2)}}{\Delta\vec{T}_{2(so2)}} \times \frac{\vec{l}_{3(so3)}}{\Delta\vec{T}_{3(so3)}}\right), (11)$$

$$\vec{l}_0 = \vec{l}_1 = \vec{l}_2 \ (So1) = 1.409\times10^{-15} m,$$

$$\Delta\vec{T}_0 = \Delta\vec{T}_1 = \Delta T_2 \ (So1) = 0.47\times10^{-23} s,$$

$$\vec{l}_3 \ (So2) = \frac{\vec{l}_0}{\gamma},$$

$$\Delta\vec{T}_3 \ (So2) = \Delta\vec{T}_0\gamma,$$

$$V^2 = C^2 - \frac{C^2}{\gamma^2},$$

$$\gamma \equiv \frac{1}{\sqrt{1-\frac{v^2}{c^2}}} : \text{ Lorentz coefficient} \qquad [4]$$

$$\vec{l} = \frac{\vec{l}_0}{\gamma}, \qquad \Delta T = \Delta\vec{T}_0\gamma, [4]$$

$$|V| = \sqrt{c^2 - \frac{c^2}{\gamma^2}} : \text{ Relative velocity of the particle.}$$

One of the results of equation 10 is that the speed of light is the same in all measuring systems and is equal to 299792458 ms^{-1}. The second result is that, since the absolute zero temperature is not achievable, no particle can

exist with $(l_0, \Delta T_0)$ therefore, there is no inertial frame of reference. This result is the second relativity postulate [4].
In the mass equation (Eq.8):

$$\vec{m} = X \cdot \frac{c^2}{\pi} \overrightarrow{\Delta T_{n-1}} \times \overrightarrow{\Delta T_n} ,$$

Despite of the changes in the particle relative velocity, the value of $\overrightarrow{\Delta T_{n-1}}$ in matter does not change for all subsequent times $(\overrightarrow{\Delta T_n} \times \overrightarrow{\Delta T_{n+1}})$. This is also true for $\overrightarrow{\Delta T_n}$ in subsequent time. $(\overrightarrow{\Delta T_{n+1}} \times \overrightarrow{\Delta T_{n+2}})$. This is true until the end of particle life time.
The difference between the past and present time quanta of a moton is that the value and size of the present time quanta changes due to the interaction with environment, but the value of the past time quanta does not change and is constant. This effects the inertial mass of the particle as follow:

$$\vec{m} = X.\frac{c^2}{\pi} \overrightarrow{\Delta T_{n-1}} \times \frac{\overrightarrow{\Delta T_n}}{\sqrt{1-\frac{v^2}{c^2}}} = \frac{\overrightarrow{m_0}}{\sqrt{1-\frac{v^2}{c^2}}} , \qquad (12)$$

and the inertial energy is given by:

$$\vec{E} = \vec{m}c^2 \Rightarrow \vec{E} = \frac{\overrightarrow{E_0}}{\sqrt{1-\frac{v^2}{c^2}}} . \qquad (13)$$

For anti-particle the value and size of the present time quanta changes and the future time quanta is constant. In fact the $\overrightarrow{\Delta T_{n+2}}$ will be constant for all subsequent times $(\overrightarrow{\Delta T_{n+1}} \times \overrightarrow{\Delta T_n})$. The mass of anti-particle is given by:

$$\overrightarrow{m^+} = X.\frac{c^2}{\pi} \overrightarrow{\Delta T_{n+1}} \times \frac{\overrightarrow{\Delta T_n}}{\sqrt{1-\frac{v^2}{c^2}}} = \frac{\overrightarrow{m_0^{\ +}}}{\sqrt{1-\frac{v^2}{c^2}}} . \qquad (14)$$

4-1 Charge calculation of the elementary particle:

The internal motion of the particle creates its dimensions. They continuously enter the space around the particle with small amount of energy. Electrical field is the time and length quanta exchange with low energy when the particle is stationary. When the particle has a relative velocity to a reference frame we define it as magnetic field. Therefore the world is continuously expanding in dimensions. The space-time bending of the particle acts as a gravity force at large distances. The space-time bending in general relativity is related to the effect of the internal motion of the particle on the surrounding space.

By quantizing time and length and using the de Broglie wavelength relation ($\lambda = \frac{h}{p} = \frac{h}{mv}$) and special relativity, we obtain the maximum velocity for elementary particles with mass. This velocity for electron and positron is equal to $v_{\max}$ = 299792407 m/s. Hence, the maximum momentum possible for a moton is given by:

$$p_{\max} = \frac{h\sqrt{1-\frac{v_{\max}{}^2}{c^2}}}{l_0\sqrt{1-\frac{v^2}{c^2}}}, \qquad (15)$$

where h is plank's constant, P_{max} is the maximum momentum and v is the particle velocity relative to a reference frame.

We define charge as the energy radiated by a particle and we have:

$$E_{\max} = \frac{p_{\max} c^2}{v} \qquad (16)$$

Here E_{max} is the maximum energy of moton, v is the relative speed of moton to a reference frame. We can conclude that the charge of a particle depends on a moton and not on the total mass of the particle itself. We call this, moton active mass. The total energy radiated from a muon is not equal to the total energy of motons because the spacetime can not have energies more than E_{max}. For instance electron and muon have the same charge absolute value but not the same mass.

In this paper we indicated that why despite of the differences in the mass of charged particles, their charge absolute value is the same. We will also talk about quarks, neutrons and neutrinos.

4.2- Definition of charge:

The amount of effect of the internal energy of particles on the surrounding space that is one length quanta or more away from the particle, is defined as electric charge. We calculate the charge using the electromagnetic interaction of positive and negative charges which are at least one length quanta apart together with equation 16:

$$q = \sqrt{(8\pi\varepsilon_0 mc^2 l_0)}C \qquad (17)$$

Here l_0 is the length quanta, q and m are the charge and active mass and $\varepsilon_0 = 8.854\times10^{-12}$ F/m is the vacuum permittivity. By applying the special relativity principles in Equation 12, we will get the following equation:

$$q = \frac{\sqrt{8\pi\varepsilon_0 m_0 c^2 l_0}}{\sqrt[4]{1-\frac{v^2}{c^2}}}C = \frac{1.602\times10^{-19}}{\sqrt[4]{1-\frac{v^2}{c^2}}}C \qquad (18)$$

With $m_0 = 9.109\times10^{-31}$ kg and $l_0 = 1.409\times10^{-15}$ m length quanta around the particle. m_0 is the initial active mass.

5.1- Modeling of lepton internal structure:

The active mass represents the particle position in the time diagram in figure 3. The active mass for electron and other particles is equal to m_0. The following model describes the internal displacement of a moton within the electron. Notice that the displacement of motons is synchronized with the super-dimension $\vec{S}_n$.

$$\begin{pmatrix} \overrightarrow{\Delta T_1} & \vec{l_1} & \overrightarrow{m_1} \\ \overrightarrow{\Delta T_2} & \vec{l_2} & \overrightarrow{E_1} \end{pmatrix} \xrightarrow{\overrightarrow{S_{e1}}} \begin{pmatrix} \overrightarrow{\Delta T_2} & \vec{l_2} & \overrightarrow{m_2} \\ \overrightarrow{\Delta T_3} & \vec{l_3} & \overrightarrow{E_2} \end{pmatrix} \xrightarrow{\overrightarrow{S_{e2}}}, \ldots \begin{pmatrix} \overrightarrow{\Delta T_{m-1}} & \overrightarrow{l_{m-1}} & \overrightarrow{m_{m-1}} \\ \overrightarrow{\Delta T_m} & \overrightarrow{l_m} & \overrightarrow{E_{m-1}} \end{pmatrix} \qquad (19)$$

$\begin{pmatrix} \overrightarrow{\Delta T_1} & \vec{l_1} & \overrightarrow{m_1} \\ \overrightarrow{\Delta T_2} & \vec{l_2} & \overrightarrow{E_1} \end{pmatrix}$: First dimensional matrix of electron (First basic matrix)

$\begin{pmatrix} \overrightarrow{\Delta T_2} & \vec{l_2} & \overrightarrow{m_2} \\ \overrightarrow{\Delta T_3} & \vec{l_3} & \overrightarrow{E_2} \end{pmatrix}$: Second dimensional matrix of electron (Second basic matrix)

$\begin{pmatrix} \frac{\overrightarrow{\Delta T_{m-1}}}{\overrightarrow{\Delta T_m}} & \frac{\overrightarrow{l_{m-1}}}{\overrightarrow{l_m}} & \frac{\overrightarrow{m_{m-1}}}{\overrightarrow{E_{m-1}}} \end{pmatrix}$: The last dimensional matrix which after that the electron converts to energy.

$\overrightarrow{m_n}$ *:* The mass of time-length sequences, n= (1, 2…m)

$\overrightarrow{E_n}$ *:* The Energy of time-length sequences, n= (1, 2…m)

Transformation from first matrix to second matrix and so on to the n_{th} matrix occurs by applying a super-dimension $\vec{S}_n$. In this model, electron has maximum 13 dimensions in the Cartesian coordinates. This model can be expanded to find the dimensional matrices of other particles. According to the relation 18 the electron charge is:

$$q_e = \frac{-1.602\times 10^{-19} c}{\sqrt[4]{1-\frac{v^2}{c^2}}} \qquad (20)$$

The displacement of an electron from the point *Sn, Sn+1* to the point S_{n+1}, Sn_{+2} in the length diagram (figure 3) induces a positive spin angular momentum .When this displacement direction in the length diagram (figure 3) reverses, while the time diagram is unchanged or in other words, when the displacement is from S_{n+1}, S_n to S_{n-1}, S_n , the negative spin angular momentum is induced.

The electron matrix with negative spin is given by:

$$\begin{pmatrix} \frac{\overrightarrow{\Delta T_1}}{\overrightarrow{\Delta T_2}} & \frac{\overrightarrow{l_m}}{\overrightarrow{l_{m-1}}} & \frac{\overrightarrow{m_1}}{\overrightarrow{E_1}} \end{pmatrix} \xrightarrow{\overrightarrow{S'_{e_1}}} \begin{pmatrix} \frac{\overrightarrow{\Delta T_1}}{\overrightarrow{\Delta T_3}} & \frac{\overrightarrow{l_{m-1}}}{\overrightarrow{l_{m-2}}} & \frac{\overrightarrow{m_2}}{\overrightarrow{E_2}} \end{pmatrix} \xrightarrow{\overrightarrow{S'_{e_2}}},\ldots \qquad (21)$$

The matrix of electron with positive spin is:

$$\begin{pmatrix} \frac{\overrightarrow{\Delta T_1}}{\overrightarrow{\Delta T_2}} & \frac{\vec{l_1}}{\vec{l_2}} & \frac{\overrightarrow{m_1}}{\overrightarrow{E_1}} \end{pmatrix} \xrightarrow{\overrightarrow{S_{e_1}}} \begin{pmatrix} \frac{\overrightarrow{\Delta T_2}}{\overrightarrow{\Delta T_3}} & \frac{\vec{l_2}}{\vec{l_3}} & \frac{\overrightarrow{m_2}}{\overrightarrow{E_2}} \end{pmatrix} \xrightarrow{\overrightarrow{S_{e_2}}},\ldots \begin{pmatrix} \frac{\overrightarrow{\Delta T_{m-1}}}{\overrightarrow{\Delta T_m}} & \frac{\overrightarrow{l_{m-1}}}{\overrightarrow{l_m}} & \frac{\overrightarrow{m_{m-1}}}{\overrightarrow{E_{m-1}}} \end{pmatrix}. \qquad (22)$$

The matrix of positron with negative spin (both the time and length diagram in figure 3 are reversed here):

$$\begin{pmatrix} \frac{\overrightarrow{\Delta T_m}}{\overrightarrow{\Delta T_{m-1}}} & \frac{\overrightarrow{l_m}}{\overrightarrow{l_{m-1}}} & \frac{\overrightarrow{m_m}}{\overrightarrow{E_m}} \end{pmatrix} \xrightarrow{\overrightarrow{S'_{\bar{e}1}}} \begin{pmatrix} \frac{\overrightarrow{\Delta T_{m-1}}}{\overrightarrow{\Delta T_{m-2}}} & \frac{\overrightarrow{l_{m-1}}}{\overrightarrow{l_{m-2}}} & \frac{\overrightarrow{m_{m-1}}}{\overrightarrow{E_{m-1}}} \end{pmatrix} \xrightarrow{\overrightarrow{S'_{\bar{e}2}}},\ldots \qquad (23)$$

The matrix of positron with positive spin angular momentum will be:

(The time diagram will be inverted, and the length diagram will be non-changed)

$$\begin{pmatrix} \overrightarrow{\Delta T_m} & \vec{l}_1 & \overrightarrow{m_m} \\ \overrightarrow{\Delta T_{m-1}} & \vec{l}_2 & \overrightarrow{E_m} \end{pmatrix} \xrightarrow{\overline{S_{\bar{e}\,1}}} \begin{pmatrix} \overrightarrow{\Delta T_{m-1}} & \vec{l}_2 & \overrightarrow{m_{m-1}} \\ \overrightarrow{\Delta T_{m-2}} & \vec{l}_3 & \overrightarrow{E_{m-1}} \end{pmatrix} \longrightarrow ,\ldots \quad (24)$$

From equation 17, the positron charge is given by:

$$q_{\bar{e}} = \frac{+1.602\times 10^{-19}c}{\sqrt[4]{1-\frac{v^2}{c^2}}}. \quad (24)$$

Assuming a small angle between the two time quanta in equation 7 and 8, a very small mass can be obtained for neutrinos (ν_e, ν_μ, ν_τ) and anti-neutrinos,

$$\left|\overrightarrow{m_{\bar{\nu}}}\right| = X.\frac{c^2}{\pi}\cdot\left|\overrightarrow{\Delta T_{n-1}}\right|.\left|\overrightarrow{\Delta T_n}\right|\cdot Sin\delta^\circ \approx (X.\frac{c^2}{\pi}\left|\Delta\vec{T}_{n-1}\right|.\left|\Delta\vec{T}_n\right|\times(\delta))kg \quad (26)$$

The matrix of a neutrino (anti-neutrino) is similar to the matrix of an electron (anti-electron). The small mass of neutrinos leads to a zero charge. For the other members of the lepton family such as μ and τ, super-dimension synchronizes a group of motons by mass. The ratio of the lepton mass to the electron mass is equal to the number of motons. Their charge is determined to an active mass which synchronize the complex of motons.

μ, τ, $\bar{\mu}$ and $\bar{\tau}$ particles have an assembly of time-length diagrams. Their S_n locations on the time diagram are bound to the S_n locations of the other motons' time diagram. The same thing is true for the length diagram. The sum of these super-dimensions leads to a larger super-dimension.

The super-dimension direction in μ and τ (like electron) and in $\bar{\mu}$ and $\bar{\tau}$ (like Positron) is determined by the spin of the particles.

The dimensional matrix of a muon with positive spin is as follows (here each two consequent rows represent the dimensions of one moton):

$$\mu:\begin{pmatrix} \overrightarrow{\Delta T_{1_{11}}} & \overrightarrow{l_{1_{12}}} & \overrightarrow{m_{1_{13}}} \\ \overrightarrow{\Delta T_{2_{21}}} & \overrightarrow{l_{2_{22}}} & \overrightarrow{E_{1_{23}}} \\ . & . & . \\ . & . & . \\ . & . & . \\ \overrightarrow{\Delta T_{1_{4131}}} & \overrightarrow{l_{1_{4132}}} & \overrightarrow{m_{1_{4133}}} \\ \overrightarrow{\Delta T_{2_{4141}}} & \overrightarrow{l_{2_{4142}}} & \overrightarrow{E_{1_{4143}}} \end{pmatrix} \xrightarrow{\overrightarrow{S_{\mu 1}}} \begin{pmatrix} \overrightarrow{\Delta T_{2_{11}}} & \overrightarrow{l_{2_{12}}} & \overrightarrow{m_{2_{13}}} \\ \overrightarrow{\Delta_{3_{21}}} & \overrightarrow{l_{3_{22}}} & \overrightarrow{E_{2_{23}}} \\ . & . & . \\ . & . & . \\ . & . & . \\ \overrightarrow{\Delta T_{2_{4131}}} & \overrightarrow{l_{2_{4132}}} & \overrightarrow{m_{2_{4133}}} \\ \overrightarrow{\Delta T_{3_{4141}}} & \overrightarrow{l_{3_{4142}}} & \overrightarrow{E_{2_{4143}}} \end{pmatrix} \xrightarrow{\overrightarrow{S_{\mu 2}}} \quad (27)$$

The dimensional matrix of a muon with negative spin is given by:

$$\mu:\begin{pmatrix} \overrightarrow{\Delta T_{1_{11}}} & \overrightarrow{l_{m_{12}}} & \overrightarrow{m_{1_{13}}} \\ \overrightarrow{\Delta T_{2_{21}}} & \overrightarrow{l_{m-1_{22}}} & \overrightarrow{E_{1_{23}}} \\ . & . & . \\ . & . & . \\ . & . & . \\ \overrightarrow{\Delta T_{1_{4131}}} & \overrightarrow{l_{m_{4132}}} & \overrightarrow{m_{1_{4133}}} \\ \overrightarrow{\Delta T_{2_{4141}}} & \overrightarrow{l_{m-1_{4142}}} & \overrightarrow{E_{1_{4143}}} \end{pmatrix} \xrightarrow{\overrightarrow{S'_{\mu 1}}} \begin{pmatrix} \overrightarrow{\Delta T_{2_{11}}} & \overrightarrow{l_{m-1_{12}}} & \overrightarrow{m_{2_{13}}} \\ \overrightarrow{\Delta_{3_{21}}} & \overrightarrow{l_{m-2_{22}}} & \overrightarrow{E_{2_{23}}} \\ . & . & . \\ . & . & . \\ . & . & . \\ \overrightarrow{\Delta T_{2_{4131}}} & \overrightarrow{l_{m-1_{4132}}} & \overrightarrow{m_{2_{4133}}} \\ \overrightarrow{\Delta T_{3_{4141}}} & \overrightarrow{l_{m-2_{4142}}} & \overrightarrow{E_{2_{4143}}} \end{pmatrix} \xrightarrow{\overrightarrow{S'_{\mu 2}}} \quad (28)$$

The dimensional matrix of an anti-muon with negative spin is:

$$\overline{\mu}:\begin{pmatrix} \overrightarrow{\Delta T_{m_{11}}} & \overrightarrow{l_{m_{12}}} & \overrightarrow{m_{1_{13}}} \\ \overrightarrow{\Delta T_{m-1_{21}}} & \overrightarrow{l_{m-1_{22}}} & \overrightarrow{E_{1_{23}}} \\ . & . & . \\ . & . & . \\ . & . & . \\ \overrightarrow{\Delta T_{m_{4131}}} & \overrightarrow{l_{m_{4132}}} & \overrightarrow{m_{1_{4133}}} \\ \overrightarrow{\Delta T_{m-1_{4141}}} & \overrightarrow{l_{m-1_{4142}}} & \overrightarrow{E_{1_{4143}}} \end{pmatrix} \xrightarrow{\overrightarrow{S'_{\overline{\mu}1}}} \begin{pmatrix} \overrightarrow{\Delta T_{m-1_{11}}} & \overrightarrow{l_{m-1_{12}}} & \overrightarrow{m_{2_{13}}} \\ \overrightarrow{\Delta T_{m-2_{21}}} & \overrightarrow{l_{m-2_{22}}} & \overrightarrow{E_{2_{23}}} \\ . & . & . \\ . & . & . \\ . & . & . \\ \overrightarrow{\Delta T_{m-1_{4131}}} & \overrightarrow{l_{m-1_{4132}}} & \overrightarrow{m_{2_{4133}}} \\ \overrightarrow{\Delta T_{m-2_{4141}}} & \overrightarrow{l_{m-2_{4142}}} & \overrightarrow{E_{2_{4143}}} \end{pmatrix} \xrightarrow{\overrightarrow{S'_{\overline{\mu}2}}} (29)$$

The dimensional matrix of an anti-muon with positive spin is given by:

$$\overline{\mu}:\begin{pmatrix} \overrightarrow{\Delta T_{m_{11}}} & \overrightarrow{l_{1_{12}}} & \overrightarrow{m_{m_{13}}} \\ \overrightarrow{\Delta T_{m-1_{21}}} & \overrightarrow{l_{2_{22}}} & \overrightarrow{E_{m_{23}}} \\ . & . & . \\ . & . & . \\ . & . & . \\ \overrightarrow{\Delta T_{m_{4131}}} & \overrightarrow{l_{1_{4132}}} & \overrightarrow{m_{m_{4133}}} \\ \overrightarrow{\Delta T_{m-1_{4141}}} & \overrightarrow{l_{2_{4142}}} & \overrightarrow{E_{m_{4143}}} \end{pmatrix} \xrightarrow{\overrightarrow{S_{\overline{\mu}1}}} \begin{pmatrix} \overrightarrow{\Delta T_{m-1_{11}}} & \overrightarrow{l_{2_{12}}} & \overrightarrow{m_{m-1_{13}}} \\ \overrightarrow{\Delta T_{m-2_{21}}} & \overrightarrow{l_{3_{22}}} & \overrightarrow{E_{m-1_{23}}} \\ . & . & . \\ . & . & . \\ . & . & . \\ \overrightarrow{\Delta T_{m-1_{4131}}} & \overrightarrow{l_{2_{4132}}} & \overrightarrow{m_{m-1_{4133}}} \\ \overrightarrow{\Delta T_{m-2_{4141}}} & \overrightarrow{l_{3_{4142}}} & \overrightarrow{E_{m-1_{4143}}} \end{pmatrix} \xrightarrow{\overrightarrow{S_{\overline{\mu}2}}} \quad (30)$$

5.2- Quarks:

The number of motons in a quark (anti-quark) is equal to the ratio of the quark (anti-quark) mass to the electron (positron) mass. Each quark has a unique active mass and the sum of these active masses determines the charge of baryons or mesons according to Equations 19 and 24. The quarks are bound together by gluons. The difference in the spatial and geometrical structures of quarks is the reason for their different colors (read, green and blue).

$$K_u = K_d = \frac{M_u}{M_e} = \frac{M_d}{M_e} = \frac{363}{0.511} = 710. \qquad (31)$$

Here K is the number of motons in quarks, M_u is the quark mass of u in baryons, M_d is the quark mass d in baryons, $M_u = M_d = 363 \quad \frac{Mev}{C^2} 2$ [3].and $K_s = \frac{M_s}{M_e} = \frac{538}{0.11} = 1053$, where M_e is the mass of electron and M_s is the mass of quark of s.

Quarks have a structure like μ. They are a group of bound motons. The first basic matrix of d, u and s is similar to μ with positive spin angular momentum. But the following matrices only exist in baryons. The first basic matrix of the quark d, u and s are given by:

$$d,u:\begin{pmatrix} \overrightarrow{\Delta T_{1_{11}}} & \overrightarrow{l_{1_{12}}} & \overrightarrow{m_{1_{13}}} \\ \overrightarrow{\Delta T_{2_{21}}} & \overrightarrow{l_{2_{22}}} & \overrightarrow{E_{1_{23}}} \\ . & . & . \\ . & . & . \\ . & . & . \\ \overrightarrow{\Delta T_{1_{14191}}} & \overrightarrow{l_{1_{14192}}} & \overrightarrow{m_{1_{14193}}} \\ \overrightarrow{\Delta T_{2_{14201}}} & \overrightarrow{l_{2_{14202}}} & \overrightarrow{E_{1_{14203}}} \end{pmatrix} \qquad s:\begin{pmatrix} \overrightarrow{\Delta T_{1_{11}}} & \overrightarrow{l_{1_{12}}} & \overrightarrow{m_{1_{13}}} \\ \overrightarrow{\Delta T_{2_{21}}} & \overrightarrow{l_{2_{22}}} & \overrightarrow{E_{1_{23}}} \\ . & . & . \\ . & . & . \\ . & . & . \\ \overrightarrow{\Delta T_{1_{21051}}} & \overrightarrow{l_{1_{21052}}} & \overrightarrow{m_{1_{21053}}} \\ \overrightarrow{\Delta T_{2_{21061}}} & \overrightarrow{l_{2_{21062}}} & \overrightarrow{E_{1_{21063}}} \end{pmatrix} \quad (32)$$

The first basic matrix of $\overline{u},\overline{d}$ and $\overline{s}$ are:

$$\overline{u},\overline{d}:\begin{pmatrix} \overrightarrow{\Delta T_{m_{11}}} & \overrightarrow{l_{1_{12}}} & \overrightarrow{m_{m_{13}}} \\ \overrightarrow{\Delta T_{m-1_{21}}} & \overrightarrow{l_{2_{22}}} & \overrightarrow{E_{m_{23}}} \\ . & . & . \\ . & . & . \\ . & . & . \\ \overrightarrow{\Delta T_{m_{14191}}} & \overrightarrow{l_{1_{14192}}} & \overrightarrow{m_{m_{14193}}} \\ \overrightarrow{\Delta T_{m-1_{14201}}} & \overrightarrow{l_{2_{14202}}} & \overrightarrow{E_{m_{14203}}} \end{pmatrix} \qquad \overline{s}:\begin{pmatrix} \overrightarrow{\Delta T_{m_{11}}} & \overrightarrow{l_{1_{12}}} & \overrightarrow{m_{m_{13}}} \\ \overrightarrow{\Delta T_{m-1_{21}}} & \overrightarrow{l_{2_{22}}} & \overrightarrow{E_{m_{23}}} \\ . & . & . \\ . & . & . \\ . & . & . \\ \overrightarrow{\Delta T_{m_{21051}}} & \overrightarrow{l_{1_{21052}}} & \overrightarrow{m_{m_{21053}}} \\ \overrightarrow{\Delta T_{m-1_{21061}}} & \overrightarrow{l_{2_{21062}}} & \overrightarrow{E_{m_{21063}}} \end{pmatrix} \quad (33)$$

Because free quark has not seen, so subsequent matrixes of quark only exist in hadrons.
Similar models can be presented for other quarks (c, b, t).
The quarks in baryons and mesons have first, second and third dimensional matrices. Proton is composed of three quarks which are held together by gluons. The mass of gluons, which is equivalent to their energy, is obtained by subtracting the mass of protons from the mass of three quarks.

$$2m_u+m_d-m_p=150Mev/c \qquad (34)$$

m_p, m_u and m_α are mass of proton, quark of $m_u = 363 \frac{\text{Mev}}{c^2}$ [3] and quark of $m_\alpha = 363 \frac{\text{Mev}}{c^2}$ [4] respectively.[3]

5.3- Gluons and photons:

A gluon can be created with three different colors, gluon 1, gluon 2 and gluon 3. There are eight color states of gluons. These colors appear in the rows of the gluon matrix with positive and negative signs sequentially. The gluon doesn't discharge if the signs of the rows and columns of a gluon matrix are all the same. Therefore the third gluon in a proton will be *gluon 1 = -1×gluon 2*. The second gluon binds the two non-identical quarks and discharges them. The second, third and higher order matrices of gluons only apply to the nuclei, baryons and muons.

$$\text{gluon 1:}\begin{pmatrix} \overrightarrow{\Delta T_{1_{11}}} & \overrightarrow{l_{1_{12}}} & \overrightarrow{\Delta E_{1_{13}}} \\ \overrightarrow{\Delta T_{1_{21}}} & \overrightarrow{l_{1_{22}}} & \overrightarrow{\Delta E_{1_{23}}} \\ . & . & . \\ . & . & . \\ . & . & . \\ \overrightarrow{\Delta T_{1_{1001}}} & \overrightarrow{l_{1_{1002}}} & \overrightarrow{\Delta E_{1_{1003}}} \end{pmatrix} \quad \text{gluon 2=}\begin{pmatrix} \overrightarrow{+\Delta T_{1_{11}}} & \overrightarrow{+l_{1_{12}}} & \overrightarrow{+\Delta E_{1_{13}}} \\ \overrightarrow{-\Delta T_{1_{21}}} & \overrightarrow{-l_{1_{22}}} & \overrightarrow{-\Delta E_{1_{23}}} \\ . & . & . \\ . & . & . \\ . & . & . \\ \overrightarrow{+\Delta T_{1_{1001}}} & \overrightarrow{+l_{1_{1002}}} & \overrightarrow{+\Delta E_{1_{1003}}} \end{pmatrix}$$

$$\text{gluon 3:}\begin{pmatrix} \overrightarrow{-\Delta T_{1_{11}}} & \overrightarrow{-l_{1_{12}}} & \overrightarrow{-\Delta E_{1_{13}}} \\ \overrightarrow{-\Delta T_{1_{21}}} & \overrightarrow{-l_{1_{22}}} & \overrightarrow{-\Delta E_{1_{23}}} \\ . & . & . \\ . & . & . \\ . & . & . \\ \overrightarrow{-\Delta T_{1_{1001}}} & \overrightarrow{-l_{1_{1002}}} & \overrightarrow{-\Delta E_{1_{1003}}} \end{pmatrix} \qquad (35)$$

We have a single row matrix for a gamma ray photon shown below:

$$\gamma : \left(\overrightarrow{\Delta T_1} \quad \overrightarrow{l_1} \quad \overrightarrow{\Delta E_1}\right) \xrightarrow{\overrightarrow{s_{\gamma 1}}} \left(\overrightarrow{\Delta T_2} \quad \overrightarrow{l_2} \quad \overrightarrow{\Delta E_2}\right) \xrightarrow{\overrightarrow{s_{\gamma 2}}} ... \qquad (36)$$

Finally the three gluons bind to quarks in super-dimension and produce a proton.

5.4-protons:

The dimensions of gluons can change under the super-dimension inside the proton. For example they can change from ΔT_n to ΔT_{n+1} and from l_n to l_{n+1}. Each gluon is bound to each quark in 50 super-dimensions S_n. Finally we get the following structure for protons with positive spin angular momentum:

$$gluon_{1_1} + u_1 + gluon_{2_1} + d_1 + gluon_{3_1} + u_1 \xrightarrow{\overrightarrow{s_{p1}}}$$
$$gluon_{1_2} + u_2 + gluon_{2_2} + d_2 + gluon_{3_1} + u_2 \xrightarrow{\overrightarrow{s_{p2}}} \quad (37)$$

And the structure of protons with negative spin angular momentum is:

$$gluon_{3_1} + u_1 + gluon_{2_1} + d_1 + gluon_{1_1} + u_1 \xrightarrow{\overrightarrow{S'_{p1}}}$$
$$gluon_{3_2} + u_2 + gluon_{2_2} + d_2 + gluon_{1_2} + u_2 \xrightarrow{\overrightarrow{S'_{p2}}} \quad (38)$$

The active mass of protons will be equal to:

$$\left|\overrightarrow{M_{active_P}}\right| = \left|\overrightarrow{M_{active_u}}\right| + \left|\overrightarrow{M_{active_u}}\right| - \left|\overrightarrow{M_{active_d}}\right| \quad (39)$$

According to Equations 16, 36 and 38, the charge of a proton is given by:

$$q_P = \frac{-1.602 \times 10^{-19} c}{\sqrt[4]{1 - \frac{v^2}{c^2}}} \quad (40)$$

The direction of the active mass vector will lead to a positive charge for protons and negative charge for electrons. We can use the proton model for other baryons.

5.5- Neutrons:

We can expand the proton structure model for neutrons. Since a neutron decays into a proton, an electron and an antineutrino, we can take a neutron as a combination of these particles. Hence, a proton binds to an electron by a two-row same-sign matrix of a gluon. This binding results in discharging of the electron and the proton.

$$n : P + \begin{pmatrix} \overrightarrow{\Delta T_{1_{11}}} & \overrightarrow{l_{1_{12}}} & \overrightarrow{\Delta E_{1_{13}}} \\ -\overrightarrow{\Delta T_{1_{21}}} & -\overrightarrow{l_{1_{22}}} & -\overrightarrow{\Delta E_{1_{23}}} \end{pmatrix} + e \xrightarrow{\overrightarrow{s_{n1}}} \ldots \quad (41)$$

The active mass of a proton will be:

$$\left|\overrightarrow{M_{active_n}}\right| = \left|\overrightarrow{M_{active_p}}\right| - \left|\overrightarrow{M_{active_e}}\right| = 0 \qquad (42)$$

From Equations 10 and 17, the charge of a neutron will be zero: $q_n = 0$. We can present a similar model for the meson family. For example the meson π^+ is composed of two quarks (u and $\overline{d}$) and one gluon. Its gluon matrix has two positive rows and one negative row sequentially.

5.6- Atomic nucleus:

We can form the nucleus structure using the neutron and proton models. For instance, there are four gluons among the helium nucleus baryons, which bind the protons and neutrons. The sign of each dimensional matrix is the opposite of its previous matrix. Therefore the active masses don't discharge each other and the helium atomic number becomes equal to two. The number of rows in each gluon is the quarter of the ratio of the total energy of baryons to the mass equivalent electron energy.

6.1- Calculation of the energy of hydrogen atomic layers:

The hydrogen atom has specific energy levels with respect to the nucleus. Electrons orbit the nucleus in these layers at certain distances from the nucleus. The smallest distance is the Bohr radius ($r_B = 0.529\times10^{-10}\ m$)[5]. We use it to calculate the energy of the first layer. Dividing the Bohr radius by the length quanta (l_0) we have:

$$n_B = \frac{r_B}{l_0} = 37544 \qquad (43)$$

n_B is the number of length quanta in the Bohr radius. As we stated before, a proton is composed of three quarks. These quarks contain a group of synchronized motons and are bound together by three gluons. When the moton is stationary, in other words when its relative velocity is zero with respect to a reference frame, the mass of a moton is equal to the electron mass (m_e). This is its maximum mass density with zero velocity.

$$\frac{m_p}{m_e} \cong \frac{V_p}{V_e} \Rightarrow r_p \cong 12\, l_0 \qquad (44)$$

$V_p and V_e$: Volume of proton and electron, r_p is the proton radius. This means that $n_p=12$ (n_p is the number of length quanta in the proton radius). We also have:

$$n_1=n_B+n_p \qquad (45)$$

Here n_1 is the number of length quanta between the center of the nucleus and the first layer of hydrogen atom.

We define E_1 as the energy of the first layer of the hydrogen atom: $q \propto E_1^{1/2}$, here q is charge. E_1 is inversely proportional to the distance between the first layer and the center of the nucleus (r_p+r_B) and ε_0 is the vacuum permittivity:

$$E_1 \propto \frac{1}{r_p + r_B}\frac{1}{\varepsilon_0} \qquad (46)$$

$$r_p+r_B+=37556\, l_0$$

The quantity E_1 is given by:

$$E_1 = \frac{8\pi\varepsilon_0 m_0 c^2 l_0}{4*2\pi*\varepsilon_0*37556*l_0} = 13.605 \text{ eV} \qquad (47)$$

We define A_0 as a basic spherical network:

$$A_0=4*2\pi*37556l_0 \qquad (48)$$

Using the fact that time and length are quantized, we can prove that the angular momentum of an electron is also quantized. Therefore electrons can only be located in the A levels which are multiples of an integer number times A_0:

n= (1, 2, 3, 4…)

$$A = n\, A_0$$

$$E_n = \frac{E_1}{n} = \frac{13.605ev}{n} \qquad (49)$$

n= layer number

6.2- Helium atom ($^{2}_{4}He$):

Based on the proton and the neutron models, we can find the structure of the helium nucleus:

$$gluon_{p-p} + P + gluon_{n-p} + n + gluon_{n-p} + P + gluon_{n-p} + n + gluon_{n-p}$$

We use the same approach as hydrogen atom to find the energy of the first helium atomic layer. The radius of the first helium atomic layer is:

$$r_{1He} = \frac{r_B}{z} \ , \qquad (50)$$

Where r_{1He} is the radius of the first helium atomic layer and $z = 2$ is the atomic number. The energy of the firs helium atom layer is as follows:

$$E_{1He} = -E_{p_1, e_1, e_2} - E_{p_2, e_1, e_2} + E_{e_1, e_2} \qquad (51)$$

Using the charge equation and the radius value of the first helium atom layer , we get:

$$E_{p_1, e_1, e_2} = E_{p_2, e_1, e_2} = 54.4ev \qquad (52)$$

We have used the following theorem to estimate E_{e_1, e_2} :

$$|e_{p1}| = |e_{p2}| = |e_{e1}| = |e_{e2}| = 1.602 \times 10^{-19} C \qquad (53)$$

So we have $|\overline{p_1 e_1}| + |\overline{p_1 e_2}| = |\overline{p_2 e_2}| + |\overline{p_2 e_1}|$ *(54)*

$\overline{pe}$: Distance between electron and proton

And then we have $\Delta npp \equiv \Delta nee$ (55)

Δnpp: The triangle which is formed between the center of mass of a neutron and the centers of charges of two protons of nucleus

Δnee: The triangle which is formed between the center of mass of a neutron of nucleus and the centers of two electrons

$\overline{pp} = 27 l_0$: Distance between the centers of charge of two protons (the center of charge and the center of mass of a proton has a distance of one quanta, at least. So $\overline{pp} = 25 l_0 + 2 l_0$.)

$\overline{np} = 25 l_0$: Distance between the center of mass of a neutron and the center of charge of a proton of nucleus

So we have:

$$\frac{25 l_0}{r_{1He}} = \frac{27 l_0}{r_{e_1, e_2}} \qquad (56)$$

Here r_{e_1, e_2} is the distance between the two electrons, According to above equations we can calculate the distance between two electrons of helium atom. With use of charge formula the energy between two electrons can be calculated.

$$E_{e_1,e_2} = 29.4ev \Rightarrow E_{1He} = -79.4ev . \quad [5] \qquad (57)$$

7.1- Conclusion:

Although the assumption of quantized length might have seemed abstractive at first, calculations of the particle charge and atomic layer energy showed that this is a valid assumption. This assumption also leads us to energy quantization.

Time quanta separate the future, present and past. This partition leads to the concepts of mater and anti-mater. This would not be possible if we had assumed that time was continuous. We supposed two different motions for motons. The binding between the present and past time and length quanta creates mater and the binding between present and future time and length quanta creates anti-mater. Hence, the assumption that time is quantized is valid.An electromagnetic field will be created around a particle if its speed changes. This field increases by increasing the electric charge of the particle. It means that if the particle energy increases, the speed of particle increases as well as its energy radiation to the environment.

Our new model also predicts the following results:

1) This model predicts the maximum speed of particles in the accelerators. For example the maximum speed of electron is: $V_{max} = 299792407$m/s.

2) In this model the kinetic energy of the charged particle is calculated to be: $E = W = \frac{q_0}{\sqrt[4]{1 - \frac{v^2}{c^2}}} \times V$. (58)

For example a electron by 100Gev nominal energy in accelerator has a real energy about

$E_{real} \approx .0001 \times 100Gev$ (59)

3) This model states that when a high energy beam of neutrinos collides with a proton, the beam deflection is maximum at a specific point. This is a point in which the charge and active mass of proton are concentrated. [6]

5) In black holes, the super-dimension $\vec{S}_n$ points get very close to each other so that they do not let energy escape. At this point even the time and length quanta collapse. This is a specific property of super-dimensions for energy absorption.

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References:

[1] Ernest M Henley,Alejandro Garcia.Subatomic Physics,Third edition.world scientific publishing Co.pte.ltd.2007

[2].john D.Barrow.The constant of nature. Pantheon Books.2002

[3].Griffiths, David J.(david jeffry).Introduction to elementary particle. john Wiley &sons,Inc.1987

[4]. Robert Resnick, Introduction to Special Relativity, *Wiley Fastern Private Limited*, 1972.

[5].James William Rohlf.Modern Physics from α to z.Wiley.1994

[6]. M.Jacob and P.landshoff,Sci.Am.(March 1980)*.