Article

Premomentumenergy Model II: Genesis of Self-Referential Matrix Law & Mathematics of Ether

Huping Hu* & Maoxin Wu

ABSTRACT

This work is a continuation of the premomentumenergy model described recently. Here we show how in this model premomentumenergy generates: (1) time, position, & intrinsic-proper-time relation from transcendental Law of One, (2) self-referential matrix law with time, position and intrinsic-proper-time relation as the determinant, (3) dual-universe Law of Zero, and (4) immanent Law of Conservation in the external/internal momentum-energy space which may be violated in certain processes. We further show how premomentum-energy generates, sustain and makes evolving elementary particles and composite particles incorporating the genesis of self-referential matrix law. In addition, we discuss the ontology and mathematics of ether in this model. Illustratively, in the beginning there was premomentumenergy by itself $e^{i0}=1$ materially empty and it began to imagine through primordial self-referential spin $1=e^{i0}=e^{i0}e^{i0}=e^{+iL-iL}e^{+iM-iM}=e^{+iL}e^{-iM}e^{+iL}e^{-iM}=e^{+iL}e^{+iM}/e^{+iL}e^{+iM}$ …such that it created the self-referential matrix law, the external object to be observed and internal object as observed, separated them into external momentum-energy space and internal momeutm-energy space, caused them to interact through said matrix law and thus gave birth to the dual universe (quantum frame) comprised of the external momentum-energy space and the internal momentum-energy space which it has since sustained and made to evolve.

Key Words: premomentumenergy, principle of existence, spin, hierarchy, self-reference, ether, mathematics, ontology, matrix law, transcendental Law of One, dual-world Law of Zero, immanent Law of Conservation.

1. Introduction

Through all of us premomentumenergy manifests

This article is a continuation of the Principle of Existence [1-4] and the premomentumenergy model [5]. As shown in our recent work [1] and further shown here, the principles and mathematics based on premomentumenergy for creating, sustaining and

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making evolving of elementary particles in the dual momentum-energy universe are beautiful and simple.

First, the premomentumenergy model employs the following ontological principles among others:

(1) Principle of oneness/unity of existence through quantum entanglement in the ether of premomentumenergy.

(2) Principle of hierarchical primordial self-referential spin creating:
- time, position and intrinsic-proper-time relation as transcendental Law of One.
- time, position and intrinsic-proper-time relation as determinant of matrix law.
- Dual-universe Law of Zero of time, position and intrinsic-proper-time.
- Immanent Law of Conservation of time, position and intrinsic-proper-time in external/internal momentum-energy space which may be violated in certain processes.

Second, premomentumenergy model employs the following mathematical elements & forms among others in order to empower the above ontological principles:

(1) *e*, Euler's Number, for (to empower) ether as foundation/basis/medium of existence (body of premomentumenergy);
(2) *i*, imaginary number, for (to empower) thoughts and imagination in premomemtumenergy (ether);
(3) 0, zero, for (to empower) emptiness (undifferentiated/primordial state);
(4) 1, one, for (to empower) oneness/unity of existence;
(5) +, -, *, /, = for (to empower) creation, dynamics, balance & conservation;
(6) Pythagorean Theorem for (to empower) time, position and intrinsic proper time relation; and
(7) *M*, matrix, for (to empower) the external and internal momentum-energy space and the interaction of external and internal wavefunctions (objects).

This work is organized as follows. In § 2, we shall illustrate scientific genesis in premomemtumenergy in a nutshell which incorporates the genesis of self-referential matrix law. In § 3, we shall detail the genesis of self-referential matrix law in the order of: (1) Genesis of Fundamental Time, Space & Intrinsic-proper-time Relation; (2) Self-Referential Matrix Law and Its Metamorphoses; (3) Imaginary Momentum; (4) Games for Deriving Matrix Law; and (5) Hierarchical Natural Laws. In § 4, we shall incorporate the genesis of self-referential matrix law into scientific genesis of primordial entities (elementary particles) and scientific genesis of composite entities. In § 5, we shall illustrate the mathematics and ontology of ether in the premomentumenergy model. Finally, in § 6, we shall conclude this work.

Readers are reminded that we can only strive for perfection, completeness and correctness in our comprehensions and writings because we are limited and imperfect.

2. Scientific Genesis in Premomentumenergy in a Nutshell

Premomentumenergy creates everything through self-referential spin

In the beginning there was premomentumenergy by by itself $e^{i0}=1$ materially empty and it began to imagine through primordial self-referential spin $1=e^{i0}=e^{i0}e^{i0}=e^{+iL-iL}e^{+iM-iM}=e^{+iL}e^{-iM}e^{+iL}e^{-iM}=e^{+iL}e^{+iM}/e^{+iL}e^{+iM}$ …such that it created the self-referential matrix law, the external object to be observed and internal object as observed, separated them into external momentum-energy space and internal momentum-energy space, caused them to interact through said matrix law and thus gave birth to a dual momentum-energy universe comprised of an external momentum-energy space and an internal momentum-energy space which it has since sustained and made to evolve.

We draw below several diagrams illustrating the above processes:

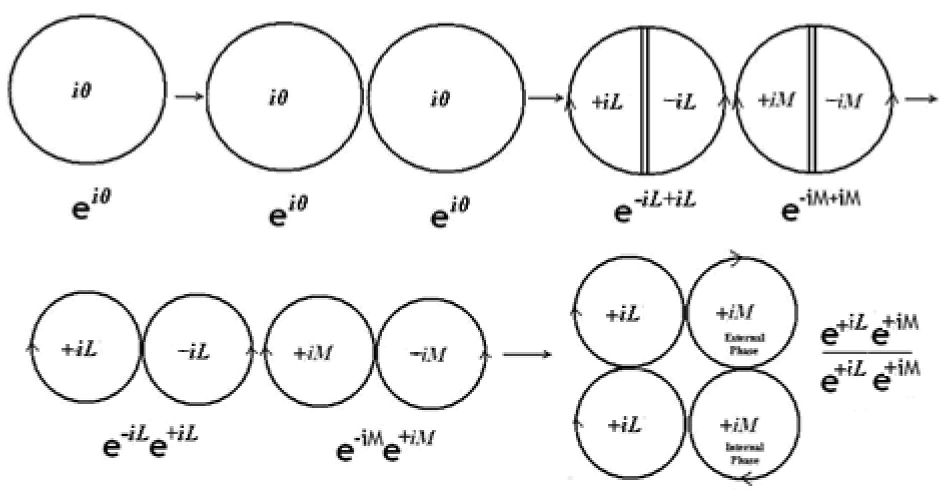

Figure 2.1 Illustration of primordial phase distinction in premomentumenergy

The primordial phase distinction in Figure 2.1 is accompanied by matrixing of premomentumenergy body *e* into: (1) external and internal wave functions as external and internal objects, and (2) self-acting and self-referential matrix law, which accompany the imaginations in premomentumenergy so as to enforce (maintain) the accounting principle of conservation of zero in the dual momentum-energy universe, as illustrated in Figure 2.2.

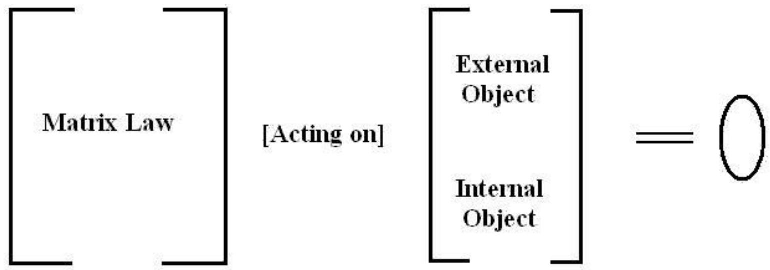

Figure2.2 Premomentumenergy Equation

Figure 2.3 shows from another perspective of the relationship among external object, internal object and the self-acting and self-referential matrix law. According to premomentumenergy model, self-interactions (self-gravity) are quantum entanglement between the external object in the external momentum-energy space and the internal object in internal momentum-energy space.

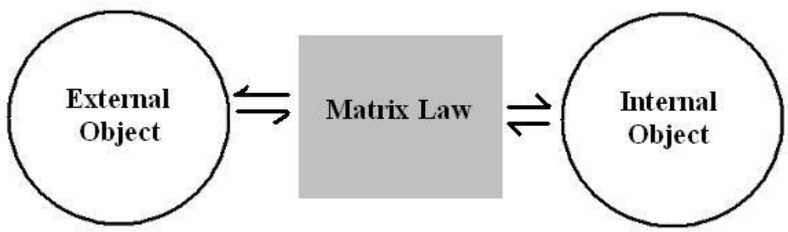

Figure2.3 Self-interaction between external object in the external momentum-energy space and the internal object in the internal momentum-energy space

Therefore, premomentumenergy model creates, sustains and causes evolution of primordial entities (elementary particles) in premomentumenergy by self-referential spin as follows:

$$1 = e^{i0} = e^{i0}e^{i0} = e^{+iL-iL}e^{+iM-iM} = L_e L_i^{-1}\left(e^{+iM}\right)\left(e^{+iM}\right)^{-1} \rightarrow$$
$$\begin{pmatrix} L_{M,e} & L_{M,i} \end{pmatrix}\begin{pmatrix} A_e e^{+iM} \\ A_i e^{+iM} \end{pmatrix} = L_M \begin{pmatrix} A_e \\ A_i \end{pmatrix} e^{-iM} = L_M \begin{pmatrix} \psi_e \\ \psi_i \end{pmatrix} = L_M \psi = 0 \qquad (2.1)$$

In expression (2.1), e is Euler's Number representing premomentumenergy body (ether or aether), i is imaginary unit representing imagination in premomentumenergy, $\pm M$ is immanent content of imagination i such as momentum, energy, space & time, $\pm L$ is immanent law of imagination *i*, $L_1 = e^{i0} = e^{+iL-iL} = L_e L_i^{-1} = 1$ is transcendental Law of One in premomentumenergy before matrixization, L_e is external law, L_i is internal law, $L_{M,e}$ is external matrix law, and $L_{M,i}$ is internal matrix law, L_M is the self-referential matrix law in premomentumenergy comprised of external and internal matrix laws which govern elementary entities and conserve zero, Ψ_e is external wave function (external object) in the external momentum-energy space, Ψ_i is internal wave function (internal object) in the internal momentum-energy space, and Ψ is the complete wave function (object/entity in the dual momentum-energy universe as a whole).

Premomentumenergy spins as $1=e^{i0}=e^{i0}e^{i0}=e^{+iL-iL}e^{+iM-iM}=e^{+iL}e^{-iM}e^{+iL}e^{-iM}=e^{+iL}e^{+iM}/e^{+iL}e^{+iM}$ …before matrixization. Premomentumenergy also spins through self-acting and self-referential matrix law L_M after matrixization which acts on external object in the external momentum-energy space and the internal object in the internal momentum-energy space to cause them to interact with each other as further described below.

3. Genesis of Self-Referential Matrix Law

Natural laws are hierarchical

3.1 Genesis of Fundamental Time, Space & Intrinsic-proper-time Relation

In the premomentumenergy model, the time, position & intrinsic proper time relation of an elementary entity:

$$(ct)^2 = \mathbf{x}^2 + (c\tau)^2 \text{ or } (ct)^2 - \mathbf{x}^2 - (c\tau)^2 = 0 \tag{3.1}$$

can be created from the following primordial self-referential spin:

$$1 = e^{i0} = e^{+iL-iL} = L_e L_i^{-1} = (\cos L + i\sin L)(\cos L - i\sin L) =$$
$$\left(\frac{c\tau}{ct} + i\frac{|\mathbf{x}|}{ct}\right)\left(\frac{c\tau}{ct} - i\frac{|\mathbf{x}|}{ct}\right) = \left(\frac{c\tau + i|\mathbf{x}|}{ct}\right)\left(\frac{c\tau - i|\mathbf{x}|}{ct}\right) = \left(\frac{(c\tau)^2 + |\mathbf{x}|^2}{(ct)^2}\right) \rightarrow$$
$$(ct)^2 = \mathbf{x}^2 + (c\tau)^2 \tag{3.2}$$

where *t* and ***x*** are dynamical variables of time and position respectively and τ is an intrinsic proper time of an elementary particle (e.g., defined as Compton wavelength divided by speed of light $\tau=\lambda/c$).

For simplicity, we will set *c=ħ=1* throughout this work unless indicated otherwise. Expression (3.2) satisfy the relation of four-position x^{μ} = (ct, $\boldsymbol{x}$) in special theory of relativity.

In the presence of an interacting field of a second primordial entity such as an electromagnetic four-potential in the dual universe comprised of the external energy-momentum space and the internal energy-momentum space:

$$A^{\mu} = (\phi_{(\mathsf{p},E)}, \mathbf{A}_{(\mathsf{p},E)}) \tag{3.3}$$

equation (3.2) becomes, for an elementary entity with charge e:

$$1 = e^{i0} = e^{+iL-iL} = L_e L_i^{-1} = (\cos L + i\sin L)(\cos L - i\sin L) =$$
$$\left(\frac{\tau}{t - e\phi_{(\mathsf{p},E)}} + i\frac{\left|\mathbf{x} - e\mathbf{A}_{(\mathsf{p},E)}\right|}{t - e\phi_{(\mathsf{p},E)}}\right)\left(\frac{\tau}{t - e\phi_{(\mathsf{p},E)}} - i\frac{\left|\mathbf{x} - e\mathbf{A}_{(\mathsf{p},E)}\right|}{t - e\phi_{(\mathsf{p},E)}}\right) =$$
$$\left(\frac{\tau + i\left|\mathbf{x} - e\mathbf{A}_{(\mathsf{p},E)}\right|}{t - e\phi_{(\mathsf{p},E)}}\right)\left(\frac{\tau - i\left|\mathbf{x} - e\mathbf{A}_{(\mathsf{p},E)}\right|}{t - e\phi_{(\mathsf{p},E)}}\right) = \left(\frac{\tau^2 + \left|\mathbf{x} - e\mathbf{A}_{(\mathsf{p},E)}\right|^2}{\left(t - e\phi_{(\mathsf{p},E)}\right)^2}\right) \rightarrow$$

$$\left(t - e\phi_{(\mathsf{p},E)}\right)^2 = \tau^2 + \left(\mathbf{x} - e\mathbf{A}_{(\mathsf{p},E)}\right)^2 \text{ or } \left(t - e\phi_{(\mathsf{p},E)}\right)^2 - \tau^2 - \left(\mathbf{x} - e\mathbf{A}_{(\mathsf{p},E)}\right)^2 = 0 \tag{3.4}$$

3.2 Self-Referential Matrix Law and Its Metamorphoses

In the premomentumenergy model, one form of matrix law L_M in premomentumenergy is created from the following primordial self-referential spin:

$$1 = e^{i0} = e^{+iL-iL} = L_e L_i^{-1} = (\cos L + i\sin L)(\cos L - i\sin L) =$$
$$\left(\frac{\tau}{t} + i\frac{|\mathbf{x}|}{t}\right)\left(\frac{\tau}{t} - i\frac{|\mathbf{x}|}{t}\right) = \left(\frac{\tau + i|\mathbf{x}|}{t}\right)\left(\frac{\tau - i|\mathbf{x}|}{t}\right) = \left(\frac{\tau^2 + \mathbf{x}^2}{t^2}\right)$$

$$= \frac{t^2 - \tau^2}{\mathbf{x}^2} = \left(\frac{t-\tau}{-|\mathbf{x}|}\right)\left(\frac{-\mathbf{x}}{t+\tau}\right)^{-1}$$
$$\rightarrow \frac{t-\tau}{-|\mathbf{x}|} = \frac{-|\mathbf{x}|}{t+\tau} \rightarrow \frac{t-\tau}{-|\mathbf{x}|} - \frac{-|\mathbf{x}|}{t+\tau} = 0 \tag{3.5}$$
$$\rightarrow \begin{pmatrix} t-\tau & -|\mathbf{x}| \\ -|\mathbf{x}| & t+\tau \end{pmatrix} = \begin{pmatrix} L_{M,e} & L_{M,i} \end{pmatrix} = L_M$$

where matrixization step is carried out in such way that

$$\mathrm{Det}(L_M) = t^2 - \tau^2 - \mathbf{x}^2 = 0 \tag{3.6}$$

so as to satisfy the fundamental relation (3.2) in the determinant view.

After fermionic spinization:

$$|\mathbf{x}| = \sqrt{\mathbf{x}^2} = \sqrt{-Det(\boldsymbol{\sigma}\cdot\mathbf{x})} \rightarrow \boldsymbol{\sigma}\cdot\mathbf{x} \tag{3.7}$$

where $\boldsymbol{\sigma} = (\sigma_1, \sigma_2, \sigma_3)$ are Pauli matrices:

$$\sigma_1 = \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix} \quad \sigma_2 = \begin{pmatrix} 0 & -i \\ i & 0 \end{pmatrix} \quad \sigma_3 = \begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix} \tag{3.8}$$

expression (3.7) becomes:

$$\begin{pmatrix} t-\tau & -\boldsymbol{\sigma}\cdot\mathbf{x} \\ -\boldsymbol{\sigma}\cdot\mathbf{x} & t+\tau \end{pmatrix} = \begin{pmatrix} L_{M,e} & L_{M,i} \end{pmatrix} = L_M \tag{3.9}$$

Expression (3.9) governs fermions in Dirac-like form such as Dirac electron and positron in a dual universe comprised of an external energy-momentum space and an internal energy-momentum space and we propose that the last expression in (3.7) governs the third state of matter (unspinized or spinless entity/particle) with charge *e* and intrinsic proper time τ such as a meson or a meson-like particle in said dual momentum-energy universe.

If we define:

$$Det_{\sigma}\begin{pmatrix} t-\tau & -\boldsymbol{\sigma}\cdot\mathbf{x} \\ -\boldsymbol{\sigma}\cdot\mathbf{x} & t+\tau \end{pmatrix}=(t-\tau)(t+\psi)-(-\boldsymbol{\sigma}\cdot\mathbf{x})(-\boldsymbol{\sigma}\cdot\mathbf{x}) \tag{3.10}$$

We get:

$$Det_{\sigma}\begin{pmatrix} t-\tau & -\boldsymbol{\sigma}\cdot\mathbf{x} \\ -\boldsymbol{\sigma}\cdot\mathbf{x} & t+\tau \end{pmatrix}=\left(t^2-\tau^2-\mathbf{x}^2\right)I_2=0 \tag{3.11}$$

Thus, fundamental relation (3.1) is also satisfied under the determinant view of expression (3.10). Indeed, we can also obtain the following conventional determinant:

$$Det\begin{pmatrix} t-\tau & -\boldsymbol{\sigma}\cdot\mathbf{x} \\ -\boldsymbol{\sigma}\cdot\mathbf{x} & t+\tau \end{pmatrix}=\left(t^2-\tau^2-\mathbf{x}^2\right)^2=0 \tag{3.12}$$

One kind of metamorphosis of expressions (3.5), (3.9), (3.10) & (3.11) is respectively as follows:

$$\begin{gathered}
1=e^{i0}=e^{+iL-iL}=L_eL_i^{-1}=(\cos L+i\sin L)(\cos L-i\sin L)= \\
\left(\frac{\tau}{t}+i\frac{|\mathbf{x}|}{t}\right)\left(\frac{\tau}{t}-i\frac{|\mathbf{x}|}{t}\right)=\left(\frac{\tau+i|\mathbf{x}|}{t}\right)\left(\frac{\tau-i|\mathbf{x}|}{t}\right)=\left(\frac{\tau^2+\mathbf{x}^2}{t^2}\right)= \\
\frac{t^2-\mathbf{x}^2}{\tau^2}=\left(\frac{t-|\mathbf{x}|}{-\tau}\right)\left(\frac{-\tau}{t+|\mathbf{x}|}\right)^{-1}\rightarrow \\
\rightarrow\frac{t-|\mathbf{x}|}{-\tau}=\frac{-\tau}{t+|\mathbf{x}|}\rightarrow\frac{t-|\mathbf{x}|}{-\tau}-\frac{-\tau}{t+|\mathbf{x}|}=0 \\
\begin{pmatrix} t-|\mathbf{x}| & -\tau \\ -\tau & t+|\mathbf{x}| \end{pmatrix}=\begin{pmatrix} L_{M,e} & L_{M,i} \end{pmatrix}=L_M
\end{gathered} \tag{3.13}$$

$$\begin{pmatrix} t-\boldsymbol{\sigma}\cdot\mathbf{x} & -\tau \\ -\tau & t+\boldsymbol{\sigma}\cdot\mathbf{x} \end{pmatrix}=\begin{pmatrix} L_{M,e} & L_{M,i} \end{pmatrix}=L_M \tag{3.14}$$

$$Det_\sigma\begin{pmatrix} t-\boldsymbol{\sigma}\cdot\mathbf{x} & -\tau \\ -\tau & t+\boldsymbol{\sigma}\cdot\mathbf{x}\end{pmatrix}=(t-\boldsymbol{\sigma}\cdot\mathbf{x})(t+\boldsymbol{\sigma}\cdot\mathbf{x})-(-\tau)(-\tau) \tag{3.15}$$

$$Det_\sigma\begin{pmatrix} t-\boldsymbol{\sigma}\cdot\mathbf{x} & -\tau \\ -\tau & t+\boldsymbol{\sigma}\cdot\mathbf{x}\end{pmatrix}=(t^2-\mathbf{x}^2-\tau^2)I_2=0 \tag{3.16}$$

The last expression in (3.13) is the unspinized matrix law in Weyl-like (chiral-like) form. Expression (3.14) is spinized matrix law in Weyl-like (chiral-like) form.

Another kind of metamorphosis of expressions (3.5), (3.9), (3.10) & (3.11) is respectively as follows:

$$\begin{gathered} 1=e^{i0}=e^{+iL-iL}=L_eL_i^{-1}=(\cos L+i\sin L)(\cos L-i\sin L)= \\ \left(\frac{\tau}{t}+i\frac{|\mathbf{x}|}{t}\right)\left(\frac{\tau}{t}-i\frac{|\mathbf{x}|}{t}\right)=\left(\frac{\tau+i|\mathbf{x}|}{t}\right)\left(\frac{\tau-i|\mathbf{x}|}{t}\right)=\left(\frac{t}{-\tau+i|\mathbf{x}|}\right)^{-1}\left(\frac{-\tau-i|\mathbf{x}|}{t}\right) \\ \rightarrow\frac{t}{-\tau+i|\mathbf{x}|}=\frac{-\tau-i|\mathbf{x}|}{t}\rightarrow\frac{t}{-\tau+i|\mathbf{x}|}-\frac{-\tau-i|\mathbf{x}|}{t}=0 \\ \rightarrow\begin{pmatrix} t & -\tau-i|\mathbf{x}| \\ -\tau+i|\mathbf{x}| & t\end{pmatrix}=\begin{pmatrix}L_e & L_i\end{pmatrix}=L_M \end{gathered} \tag{3.17}$$

$$\begin{pmatrix} t & -\tau-i\boldsymbol{\sigma}\cdot\mathbf{x} \\ -\tau+i\boldsymbol{\sigma}\cdot\mathbf{x} & t\end{pmatrix}=\begin{pmatrix}L_{M,e} & L_{M,i}\end{pmatrix}=L_M \tag{3.18}$$

$$Det_\sigma\begin{pmatrix} t & -\tau-i\boldsymbol{\sigma}\cdot\mathbf{x} \\ -\tau+i\boldsymbol{\sigma}\cdot\mathbf{x} & t\end{pmatrix}=tt-(-s-i\boldsymbol{\sigma}\cdot\mathbf{x})(-s+i\boldsymbol{\sigma}\cdot\mathbf{x}) \tag{3.19}$$

$$Det_\sigma\begin{pmatrix} t & -\tau-i\boldsymbol{\sigma}\cdot\mathbf{x} \\ -\tau+i\boldsymbol{\sigma}\cdot\mathbf{x} & t\end{pmatrix}=(t^2-\tau^2-\mathbf{x}^2)I_2=0 \tag{3.20}$$

Indeed, $Q=\tau+i\boldsymbol{\sigma}\cdot\mathbf{x}$ is a quaternion and $Q^*=\tau-i\boldsymbol{\sigma}\cdot\mathbf{x}$ is its conjugate. So we can rewrite expression (3.18) as:

$$\begin{pmatrix} t & -Q \\ -Q^* & t\end{pmatrix}=\begin{pmatrix}L_{M,e} & L_{M,i}\end{pmatrix}=L_M \tag{3.21}$$

If τ=0, we have from expression (3.5):

$$1 = e^{i0} = e^{+iL-iL} = L_e L_i^{-1} = (\cos L + i\sin L)(\cos L - i\sin L) =$$
$$\left(\frac{0}{t} + i\frac{|\mathbf{x}|}{t}\right)\left(\frac{0}{t} - i\frac{|\mathbf{x}|}{t}\right) = \left(+i\frac{|\mathbf{x}|}{t}\right)\left(-i\frac{|\mathbf{x}|}{t}\right) = \left(\frac{\mathbf{x}^2}{t^2}\right)$$
$$= \frac{t^2}{\mathbf{x}^2} = \left(\frac{t}{-|\mathbf{x}|}\right)\left(\frac{-|\mathbf{x}|}{t}\right)^{-1}$$
$$\rightarrow \frac{t}{-|\mathbf{x}|} = \frac{-|\mathbf{x}|}{t} \rightarrow \frac{t}{-|\mathbf{x}|} - \frac{-|\mathbf{x}|}{t} = 0 \tag{3.22}$$
$$\rightarrow \begin{pmatrix} t & -|\mathbf{x}| \\ -|\mathbf{x}| & t \end{pmatrix} = \begin{pmatrix} L_{M,e} & L_{M,i} \end{pmatrix} = L_M$$

After fermionic spinization $|\mathbf{x}| \rightarrow \sigma\cdot\mathbf{x}$, the last expression in (3.22) becomes:

$$\begin{pmatrix} t & -\boldsymbol{\sigma}\cdot\mathbf{x} \\ -\boldsymbol{\sigma}\cdot\mathbf{x} & t \end{pmatrix} = \begin{pmatrix} L_{M,e} & L_{M,i} \end{pmatrix} = L_M \tag{3.23}$$

which governs intrinsic-proper-time-less (massless) fermion (neutrino) in Dirac-like form in said dual momentum-energy universe.

After bosonic spinization:

$$|\mathbf{x}| = \sqrt{\mathbf{x}^2} = \sqrt{-(Det(\mathbf{s}\cdot\mathbf{x}+I_3)-Det(I_3))} \rightarrow \mathbf{s}\cdot\mathbf{x} \tag{3.24}$$

the last expression in (3.22) becomes:

$$\begin{pmatrix} t & -\mathbf{s}\cdot\mathbf{x} \\ -\mathbf{s}\cdot\mathbf{x} & t \end{pmatrix} = \begin{pmatrix} L_{M,e} & L_{M,i} \end{pmatrix} = L_M \tag{3.25}$$

where $\mathbf{s} = (s_1, s_2, s_3)$ are spin operators for spin 1 particle:

$$s_1=\begin{pmatrix}0&0&0\\0&0&-i\\0&i&0\end{pmatrix}\quad s_2=\begin{pmatrix}0&0&i\\0&0&0\\-i&0&0\end{pmatrix}\quad s_3=\begin{pmatrix}0&-i&0\\i&0&0\\0&0&0\end{pmatrix} \tag{3.26}$$

If we define:

$$Det_s\begin{pmatrix}t&-\mathbf{s}\cdot\mathbf{x}\\-\mathbf{s}\cdot\mathbf{x}&t\end{pmatrix}=(t)(t)-(-\mathbf{s}\cdot\mathbf{x})(-\mathbf{s}\cdot\mathbf{x}) \tag{3.27}$$

We get:

$$Det_s\begin{pmatrix}t&-\mathbf{s}\cdot\mathbf{x}\\-\mathbf{s}\cdot\mathbf{x}&t\end{pmatrix}=\left(t^2-\mathbf{x}^2\right)I_3-\begin{pmatrix}x^2&xy&xz\\yx&y^2&yz\\zx&zy&z^2\end{pmatrix} \tag{3.28}$$

To obey fundamental relation (3.1) in determinant view (3.27), we shall require the last term in (3.28) acting on the external and internal wave functions respectively to produce null result (zero) in source-free zone as discussed later.

We propose that the last expression in (3.22) governs intrinsic-proper-time-less (massless) particle with unobservable spin (spinless). After bosonic spinization, the spinless particle gains its spin 1.

Further, if |**p**|=0, we have from expression (3.5):

$$1=e^{i0}=e^{+iL-iL}=L_eL_i^{-1}=(\cos L+i\sin L)(\cos L-i\sin L)=$$
$$\left(\frac{\tau}{t}+i\frac{0}{t}\right)\left(\frac{\tau}{t}-i\frac{0}{t}\right)=\left(\frac{\tau}{t}\right)\left(\frac{\tau}{t}\right)=\left(\frac{\tau^2}{t^2}\right)$$

$$= \frac{t^2}{\tau^2} = \left(\frac{t}{-\tau}\right)\left(\frac{-\tau}{t}\right)^{-1}$$
$$\rightarrow \frac{t}{-\tau} = \frac{-\psi}{t} \rightarrow \frac{t}{-\tau} - \frac{-\tau}{t} = 0 \tag{3.29}$$
$$\rightarrow \begin{pmatrix} t & -\tau \\ -\tau & t \end{pmatrix} = \begin{pmatrix} L_{M,e} & L_{M,i} \end{pmatrix} = L_M$$

We suggest that the above momentum-less forms of matrix law govern the external and internal wave functions (self-fields) which play the roles of momentum-less gravitons, that is, they mediate momentum (distance) independent interactions through intrinsic proper time (mass) entanglement.

3.3 Imaginary Position

Premomentumenergy model can create momentum self-confinement of an elementary entity through imaginary position $\mathbf{x}_i$ (downward self-reference such that $\tau^2 > t^2$):

$$\tau^2 - t^2 = -\mathbf{x}_i^2 = -x_i^2 - y_i^2 - z_i^2 = \left(i\mathbf{x}_i\right)^2 = -Det(\boldsymbol{\sigma} \cdot i\mathbf{x}_i) \tag{3.30}$$

that is:

$$t^2 - \tau^2 - \mathbf{x}_i^2 = 0 \tag{3.31}$$

which can be created by the following primordial self-referential spin:

$$1 = e^{i0} = e^{+iL-iL} = L_e L_i^{-1} = \left(\cos L + i\sin L\right)\left(\cos L - i\sin L\right) =$$
$$\left(\frac{\tau}{t} + i\frac{|\mathbf{x}_i|}{t}\right)\left(\frac{\tau}{t} - i\frac{|\mathbf{x}_i|}{t}\right) = \left(\frac{\tau + i|\mathbf{x}_i|}{t}\right)\left(\frac{\tau - i|\mathbf{x}_i|}{t}\right) = \left(\frac{\tau^2 + \mathbf{x}_i^{\ 2}}{t^2}\right) \rightarrow$$
$$t^2 = \tau^2 + \mathbf{x}_i^{\ 2} \text{ or } t^2 - \tau^2 - \mathbf{x}_i^{\ 2} = 0 \tag{3.32}$$

Therefore, allowing imaginary position (downward self-reference) for an elementary entity, we can derive the following matrix law in Dirac-like form:

$$\begin{pmatrix} t-\tau & -|\mathbf{x}_i| \\ -|\mathbf{x}_i| & t+\tau \end{pmatrix} = \begin{pmatrix} L_{M,e} & L_{M,i} \end{pmatrix} = L_M \tag{3.33}$$

$$\begin{pmatrix} -\tau & -\sigma\cdot\mathbf{x}_i \\ -\sigma\cdot\mathbf{x}_i & +\tau \end{pmatrix} = \begin{pmatrix} L_{M,e} & L_{M,i} \end{pmatrix} = L_M \tag{3.34}$$

Also, we can derive the following matrix law in Weyl-like (chiral-like) form:

$$\begin{pmatrix} t-|\mathbf{x}_i| & -\tau \\ -\tau & +|\mathbf{x}_i| \end{pmatrix} = \begin{pmatrix} L_{M,e} & L_{M,i} \end{pmatrix} = L_M \tag{3.35}$$

$$\begin{pmatrix} t-\sigma\cdot\mathbf{x}_i & -\tau \\ -\tau & E+\sigma\cdot\mathbf{x}_i \end{pmatrix} = \begin{pmatrix} L_{M,e} & L_{M,i} \end{pmatrix} = L_M \tag{3.36}$$

It is suggested that the above additional forms of self-referential matrix law govern proton in Dirac-like and Weyl-like form respectively in the dual universe comprised of the external energy-momentum space and the internal energy-momentum space.

3.4 Games for Deriving Matrix Law

The games for deriving various forms of the matrix law prior to spinization can be summarized as follows:

$$\begin{aligned} 0 = t^2 - \tau^2 - \mathbf{x}^2 &= \left(DetM_t + DetM_\tau + DetM_x\right) \\ &= Det(M_t + M_\tau + M_x) = Det(L_M) \end{aligned} \tag{3.37}$$

where *Det* means determinant and M_t, M_τ and M_x are respectively matrices with $\pm t$ (or $\pm it$), $\pm\tau$ (or $\pm i\tau$) and $\pm|\mathbf{x}|$ (or $\pm i|\mathbf{x}|$) as elements respectively, and t^2, $-\tau^2$ and $-\mathbf{x}^2$ as determinant respectively, and L_M is the matrix law so derived.

For example, the matrix law in Dirac-like form prior to spinization:

$$L_M = \begin{pmatrix} t-\tau & -|\mathbf{x}| \\ -|\mathbf{x}| & t+\tau \end{pmatrix} \tag{3.38}$$

can be derived as follows:

$$0 = t^2 - \tau^2 - \mathbf{x}^2 = Det\begin{pmatrix} t & 0 \\ 0 & t \end{pmatrix} + Det\begin{pmatrix} -\tau & 0 \\ 0 & \tau \end{pmatrix} + Det\begin{pmatrix} 0 & -|\mathbf{x}| \\ -|\mathbf{x}| & 0 \end{pmatrix} =$$

$$Det\left(\begin{pmatrix} t & 0 \\ 0 & t \end{pmatrix}+\begin{pmatrix} -\tau & 0 \\ 0 & \tau \end{pmatrix}+\begin{pmatrix} 0 & -|\mathbf{x}| \\ -|\mathbf{x}| & 0 \end{pmatrix}\right)=Det\begin{pmatrix} t-\tau & -|\mathbf{x}| \\ -|\mathbf{x}| & t+\tau \end{pmatrix}=Det(L_M) \tag{3.39}$$

For a second example, the matrix law in Weyl-like form prior to spinization:

$$L_M=\begin{pmatrix} t-|\mathbf{x}| & -\tau \\ -\tau & t+|\mathbf{x}| \end{pmatrix} \tag{3.40}$$

can be derived as follows:

$$0=t^2-\tau^2-\mathbf{x}^2=Det\begin{pmatrix} t & 0 \\ 0 & t \end{pmatrix}+Det\begin{pmatrix} 0 & -\tau \\ -\tau & 0 \end{pmatrix}+Det\begin{pmatrix} -|\mathbf{x}| & 0 \\ 0 & |\mathbf{x}| \end{pmatrix}=$$

$$Det\left(\begin{pmatrix} t & 0 \\ 0 & t \end{pmatrix}+\begin{pmatrix} 0 & -\tau \\ -\tau & 0 \end{pmatrix}+\begin{pmatrix} -|\mathbf{x}| & 0 \\ 0 & |\mathbf{x}| \end{pmatrix}\right)=Det\begin{pmatrix} t-|\mathbf{x}| & -\tau \\ -\tau & t+|\mathbf{x}| \end{pmatrix}=Det(L_M) \tag{3.41}$$

For a third example, the matrix law in quaternion form prior to spinization:

$$L_M=\begin{pmatrix} t & -\tau-i|\mathbf{x}| \\ -\tau+i|\mathbf{x}| & t \end{pmatrix} \tag{3.42}$$

can be derived as follows:

$$0=t^2-\tau^2-\mathbf{x}^2=Det\begin{pmatrix} t & 0 \\ 0 & t \end{pmatrix}+Det\begin{pmatrix} 0 & -\tau \\ -\tau & 0 \end{pmatrix}+Det\begin{pmatrix} 0 & -i|\mathbf{x}| \\ i|\mathbf{x}| & 0 \end{pmatrix}=$$

$$Det\left(\begin{pmatrix} t & 0 \\ 0 & t \end{pmatrix}+\begin{pmatrix} 0 & -\tau \\ -\tau & 0 \end{pmatrix}+\begin{pmatrix} 0 & -i|\mathbf{x}| \\ i|\mathbf{x}| & 0 \end{pmatrix}\right)=Det\begin{pmatrix} t & -\tau-i|\mathbf{x}| \\ -\tau+i|\mathbf{x}| & t \end{pmatrix}=Det(L_M) \tag{3.43}$$

3.5 Hierarchical Natural Laws

The natural laws created in accordance with the premomentumenergy model are hierarchical and comprised of: (1) immanent Law of Conservation manifesting and governing in the external or internal momentum-energy space which may be violated in certain processes; (2) immanent Law of Zero manifesting and governing in the dual momentum-energy universe as a whole; and (3) transcendental Law of One manifesting and governing in premomentumenergy. By ways of examples, conservations of time, position and intrinsic proper time are immanent (and maybe approximate) laws manifesting and governing in the external or internal momentum-energy universe. Conservations of time, position or intrinsic proper time to zero in the dual momentum-energy universe comprised of the external momentum-energy universe and the internal momentum-energy universe are immanent law manifesting and governing in the dual universe as a whole. Conservation of One (Unity) based on time, position and intrinsic proper time relation is transcendental law manifesting and governing in premomentumenergy which is the foundation of the dual momentum-energy universe.

4. Scientific Genesis of Elementary Particle in Premomentumenergy

4.1 Scientific Genesis of Primordial Entities in the Premomentumenergy Model

Premomentumenergy model creates, sustains and causes evolution of a free plane-wave fermion particle such as an electron in Dirac-like form in a dual universe comprised of an external energy-momentum space and an internal energy-momentum space as follows:

$$
\begin{aligned}
&1 = e^{i0} = e^{i0}e^{i0} = e^{+iL-iL}e^{+iM-iM} = \\
&(\cos L + i\sin L)(\cos L - i\sin L)e^{+iM-iM} = \\
&\left(\frac{\tau}{t} + i\frac{|\mathbf{x}|}{t}\right)\left(\frac{\tau}{t} - i\frac{|\mathbf{x}|}{t}\right)e^{+ip^{\mu}x_{\mu}-ip^{\mu}x_{\mu}} \\
&= \left(\frac{\tau + i|\mathbf{x}|}{t}\right)\left(\frac{\tau - i|\mathbf{x}|}{t}\right)e^{+ip^{\mu}x_{\mu}-ip^{\mu}x_{\mu}} \\
&= \left(\frac{\tau^2 + \mathbf{x}^2}{t^2}\right)e^{+ip^{\mu}x_{\mu}-ip^{\mu}x_{\mu}} = \frac{t^2 - \tau^2}{\mathbf{x}^2}e^{+ip^{\mu}x_{\mu}-ip^{\mu}x_{\mu}} \\
&= \left(\frac{t-\tau}{-|\mathbf{x}|}\right)\left(\frac{-|\mathbf{x}|}{t+\tau}\right)^{-1}\left(e^{+ip^{\mu}x_{\mu}}\right)\left(e^{+ip^{\mu}x_{\mu}}\right)^{-1} \rightarrow \\
&\frac{t-\tau}{-|\mathbf{x}|}e^{+ip^{\mu}x_{\mu}} = \frac{-|\mathbf{x}|}{t+\tau}e^{+ip^{\mu}x_{\mu}} \rightarrow \frac{t-\tau}{-|\mathbf{x}|}e^{+ip^{\mu}x_{\mu}} - \frac{-|\mathbf{x}|}{t+\tau}e^{+ip^{\mu}x_{\mu}} = 0
\end{aligned}
\tag{4.1}
$$

$$\rightarrow\begin{pmatrix} t-\tau & -|\mathbf{x}| \\ -|\mathbf{x}| & t+\tau \end{pmatrix}\begin{pmatrix} a_{e,+}e^{+ip^{\mu}x_{\mu}} \\ a_{i,-}e^{+ip^{\mu}x_{\mu}} \end{pmatrix}=\begin{pmatrix} L_{M,e} & L_{M,i} \end{pmatrix}\begin{pmatrix} \psi_{e,+} \\ \psi_{i,-} \end{pmatrix}=L_M\psi=0$$

$$\rightarrow\begin{pmatrix} t-\tau & -\boldsymbol{\sigma}\cdot\mathbf{x} \\ -\boldsymbol{\sigma}\cdot\mathbf{x} & t+\tau \end{pmatrix}\begin{pmatrix} A_{e,+}e^{+ip^{\mu}x_{\mu}} \\ A_{i,-}e^{+ip^{\mu}x_{\mu}} \end{pmatrix}=\begin{pmatrix} L_{M,e} & L_{M,i} \end{pmatrix}\begin{pmatrix} \psi_{e,+} \\ \psi_{i,-} \end{pmatrix}=L_M\psi=0$$

that is:

$$\begin{pmatrix} (t-\tau)\psi_{e,+}=\boldsymbol{\sigma}\cdot\mathbf{x}\psi_{i,-} \\ (t+\tau)\psi_{i,-}=\boldsymbol{\sigma}\cdot\mathbf{x}\psi_{e,+} \end{pmatrix}\text{or}\begin{pmatrix} i\partial_E\psi_{e,+}+\tau\psi_{e,+}=-i\boldsymbol{\sigma}\cdot\nabla_P\psi_{i,-} \\ i\partial_E\psi_{i,-}-\tau\psi_{i,-}=-i\boldsymbol{\sigma}\cdot\nabla_P\psi_{e,+} \end{pmatrix} \tag{4.2}$$

where substitutions $t\rightarrow -i\partial_E$ and $\mathbf{x}\rightarrow i\nabla_P$ have been made so that components of L_M can act on the external and internal wave functions.

Premomentumenergy model creates, sustains and causes evolution of a free plane-wave antifermion such as a positron in Dirac-like form in said dual universe comprised of said external energy-momentum space and said internal energy-momentum space as follows:

$$1=e^{i0}=e^{i0}e^{i0}=e^{+iL-iL}e^{-iM+iM}$$

$$(\cos L+i\sin L)(\cos L-i\sin L)e^{-iM+iM}=$$

$$\left(\frac{\tau}{t}+i\frac{|\mathbf{x}|}{s}\right)\left(\frac{\tau}{t}-i\frac{|\mathbf{x}|}{t}\right)e^{-ip^{\mu}x_{\mu}+ip^{\mu}x_{\mu}}$$

$$=\left(\frac{\tau+i|\mathbf{x}|}{t}\right)\left(\frac{\tau-i|\mathbf{x}|}{t}\right)e^{-ip^{\mu}x_{\mu}+ip^{\mu}x_{\mu}}$$

$$=\left(\frac{\tau^2+\mathbf{x}^2}{t^2}\right)e^{-ip^{\mu}x_{\mu}+ip^{\mu}x_{\mu}}=\frac{t^2-\tau^2}{\mathbf{x}^2}e^{-ip^{\mu}x_{\mu}+ip^{\mu}x_{\mu}}$$

$$=\left(\frac{t-\tau}{-|\mathbf{x}|}\right)\left(\frac{-|\mathbf{x}|}{t+\tau}\right)^{-1}\left(e^{-ip^{\mu}x_{\mu}}\right)\left(e^{-ip^{\mu}x_{\mu}}\right)^{-1}\rightarrow$$

$$\frac{t-\tau}{-|\mathbf{x}|}e^{-ip^{\mu}x_{\mu}}=\frac{-|\mathbf{x}|}{t+\tau}e^{-ip^{\mu}x_{\mu}}\rightarrow\frac{t-\tau}{-|\mathbf{x}|}e^{-ip^{\mu}x_{\mu}}-\frac{-|\mathbf{x}|}{t+\tau}e^{-ip^{\mu}x_{\mu}}=0 \tag{4.3}$$

$$\rightarrow\begin{pmatrix} t-\tau & -|\mathbf{x}| \\ -|\mathbf{x}| & t+\tau \end{pmatrix}\begin{pmatrix} a_{e,-}e^{-ip^{\mu}x_{\mu}} \\ a_{i,+}e^{-ip^{\mu}x_{\mu}} \end{pmatrix}=\begin{pmatrix} L_{M,e} & L_{M,i} \end{pmatrix}\begin{pmatrix} \psi_{e,-} \\ \psi_{i,+} \end{pmatrix}=L_M\psi=0$$

$$\rightarrow\begin{pmatrix} t-\tau & -\boldsymbol{\sigma}\cdot\mathbf{x} \\ -\boldsymbol{\sigma}\cdot\mathbf{x} & t+\tau \end{pmatrix}\begin{pmatrix} A_{e,-}e^{-ip^{\mu}x_{\mu}} \\ A_{i,+}e^{-ip^{\mu}x_{\mu}} \end{pmatrix}=\begin{pmatrix} L_{M,e} & L_{M,i} \end{pmatrix}\begin{pmatrix} \psi_{e,-} \\ \psi_{i,+} \end{pmatrix}=L_M\psi=0$$

Similarly, premomentumenergy creates, sustains and causes evolution of a free plane-wave fermion in Weyl-like (chiral-like) form in said dual universe comprised of said external energy-momentum space and said internal energy-momentum space as follows:

$$1=e^{i0}=e^{i0}e^{i0}=e^{+iL-iL}e^{+iM-iM}$$

$$(\cos L+i\sin L)(\cos L-i\sin L)e^{-iM+iM}=$$

$$\left(\frac{\tau}{t}+i\frac{|\mathbf{x}|}{t}\right)\left(\frac{\tau}{t}-i\frac{|\mathbf{x}|}{t}\right)e^{+ip^{\mu}x_{\mu}-ip^{\mu}x_{\mu}}$$

$$=\left(\frac{\tau+i|\mathbf{x}|}{t}\right)\left(\frac{\tau-i|\mathbf{x}|}{t}\right)e^{+ip^{\mu}x_{\mu}-ip^{\mu}x_{\mu}}$$

$$=\left(\frac{\tau^2+\mathbf{x}^2}{t^2}\right)e^{+ip^{\mu}x_{\mu}-ip^{\mu}x_{\mu}}=\frac{t^2-\mathbf{x}^2}{\tau^2}e^{+ip^{\mu}x_{\mu}-ip^{\mu}x_{\mu}}$$

$$=\left(\frac{t-|\mathbf{x}|}{-\tau}\right)\left(\frac{-\tau}{t+|\mathbf{x}|}\right)^{-1}\left(e^{+ip^{\mu}x_{\mu}}\right)\left(e^{+ip^{\mu}x_{\mu}}\right)^{-1}\rightarrow \tag{4.4}$$

$$\frac{t-|\mathbf{x}|}{-\tau}e^{+ip^{\mu}x_{\mu}}=\frac{-\tau}{t+|\mathbf{x}|}e^{+ip^{\mu}x_{\mu}}\rightarrow\frac{t-|\mathbf{x}|}{-\tau}e^{+ip^{\mu}x_{\mu}}-\frac{-\tau}{t+|\mathbf{x}|}e^{+ip^{\mu}x_{\mu}}=0$$

$$\rightarrow\begin{pmatrix} t-|\mathbf{x}| & -\tau \\ -\tau & t+|\mathbf{x}| \end{pmatrix}\begin{pmatrix} a_{e,l}e^{+ip^{\mu}x_{\mu}} \\ a_{i,r}e^{+ip^{\mu}x_{\mu}} \end{pmatrix}=\begin{pmatrix} L_{M,e} & L_{M,i} \end{pmatrix}\begin{pmatrix} \psi_{e,l} \\ \psi_{i,r} \end{pmatrix}=L_M\psi=0$$

$$\rightarrow\begin{pmatrix} t-\boldsymbol{\sigma}\cdot\mathbf{x} & -\tau \\ -\tau & t+\boldsymbol{\sigma}\cdot\mathbf{x} \end{pmatrix}\begin{pmatrix} A_{e,l}e^{+ip^{\mu}x_{\mu}} \\ A_{i,r}e^{+ip^{\mu}x_{\mu}} \end{pmatrix}=\begin{pmatrix} L_{M,e} & L_{M,i} \end{pmatrix}\begin{pmatrix} \psi_{e,l} \\ \psi_{i,r} \end{pmatrix}=L_M\psi=0$$

that is:

$$\begin{pmatrix} (t-\boldsymbol{\sigma}\cdot\mathbf{x})\psi_{e,l}=\tau\psi_{i,r} \\ (t+\boldsymbol{\sigma}\cdot\mathbf{x})\psi_{i,r}=\tau\psi_{e,l} \end{pmatrix} \text{ or } \begin{pmatrix} i\partial_E\psi_{e,l}+i\boldsymbol{\sigma}\cdot\nabla_p\psi_{e,l}=-\tau\psi_{i,r} \\ i\partial_E\psi_{i,r}-i\boldsymbol{\sigma}\cdot\nabla_p\psi_{i,-}=-\tau\psi_{e,l} \end{pmatrix} \tag{4.5}$$

Premomentumenergy model creates, sustains and causes evolution of a free plane-wave fermion in another form in said dual universe comprised of said external energy-momentum space and said internal energy-momentum space as follows:

$$\begin{aligned}
1=e^{i0}&=e^{i0}e^{i0}=e^{+iL-iL}e^{+iM-iM} \\
&(\cos L+i\sin L)(\cos L-i\sin L)e^{+iM-iM}= \\
&\left(\frac{\tau}{t}+i\frac{|\mathbf{x}|}{t}\right)\left(\frac{\tau}{t}-i\frac{|\mathbf{x}|}{t}\right)e^{+ip^\mu x_\mu-ip^\mu x_\mu} \\
&=\left(\frac{\tau+i|\mathbf{x}|}{t}\right)\left(\frac{\tau-i|\mathbf{x}|}{t}\right)e^{+ip^\mu x_\mu-ip^\mu x_\mu} \\
&=\left(\frac{t}{-\tau+i|\mathbf{x}|}\right)\left(\frac{-\tau-i|\mathbf{x}|}{t}\right)^{-1}\left(e^{+ip^\mu x_\mu}\right)\left(e^{+ip^\mu x_\mu}\right)^{-1} \\
&\to\frac{t}{-\tau+i|\mathbf{x}|}e^{+ip^\mu x_\mu}=\frac{-\tau-i|\mathbf{x}|}{t}e^{+ip^\mu x_\mu} \\
&\to\frac{t}{-\tau+i|\mathbf{x}|}e^{+ip^\mu x_\mu}-\frac{-\tau-i|\mathbf{x}|}{t}e^{+ip^\mu x_\mu}=0 \\
&\to\begin{pmatrix} t & -\tau-i|\mathbf{x}| \\ -\tau+i|\mathbf{x}| & t \end{pmatrix}\begin{pmatrix} a_e e^{+ip^\mu x_\mu} \\ a_i e^{+ip^\mu x_\mu} \end{pmatrix}=0 \\
&\to\begin{pmatrix} t & -Q \\ -Q^* & t \end{pmatrix}\begin{pmatrix} A_e e^{+ip^\mu x_\mu} \\ A_i e^{+ip^\mu x_\mu} \end{pmatrix}=\begin{pmatrix} L_{M,e} & L_{M,i} \end{pmatrix}\begin{pmatrix} \psi_e \\ \psi_i \end{pmatrix}=L_M\psi=0
\end{aligned} \tag{4.6}$$

where $Q=\tau+i\boldsymbol{\sigma}\cdot\mathbf{x}$ is a quaternion and $Q^*=\tau-i\boldsymbol{\sigma}\cdot\mathbf{x}$ is its conjugate,

that is:

$$\begin{pmatrix} t\psi_e=(\tau+i\boldsymbol{\sigma}\cdot\mathbf{x})\psi_i \\ t\psi_i=(\tau-i\boldsymbol{\sigma}\cdot\mathbf{x})\psi_e \end{pmatrix} \text{ or } \begin{pmatrix} i\partial_E\psi_e=-\tau\psi_i-\boldsymbol{\sigma}\cdot\nabla_p\psi_i \\ i\partial_E\psi_i=-\tau\psi_e+\boldsymbol{\sigma}\cdot\nabla_p\psi_i \end{pmatrix} \tag{4.7}$$

Premomentumenergy model creates, sustains and causes evolution of a linear plane-wave photon in said dual universe comprised of said external energy-momentum space and said internal energy-momentum space as follows:

$$
\begin{gathered}
1 = e^{i0} = e^{i0}e^{i0} = e^{+iL-iL}e^{+iM-iM} \\
(\cos L + i\sin L)(\cos L - i\sin L)e^{+iM-iM} = \\
\left(\frac{0}{t} + i\frac{|\mathbf{x}|}{t}\right)\left(\frac{0}{t} - i\frac{|\mathbf{x}|}{t}\right)e^{+ip^\mu x_\mu - ip^\mu x_\mu} \\
= \left(+i\frac{|\mathbf{x}|}{t}\right)\left(-i\frac{|\mathbf{x}|}{t}\right)e^{+ip^\mu x_\mu - ip^\mu x_\mu} \\
\left(\frac{\mathbf{x}^2}{t^2}\right)e^{+ip^\mu x_\mu - ip^\mu x_\mu} = \left(\frac{t^2}{\mathbf{x}^2}\right)e^{+ip^\mu x_\mu - ip^\mu x_\mu} = \\
\left(\frac{t}{-|\mathbf{x}|}\right)\left(\frac{-|\mathbf{x}|}{t}\right)^{-1}\left(e^{+ip^\mu x_\mu}\right)\left(e^{+ip^\mu x_\mu}\right)^{-1} \to \\
\frac{t}{-|\mathbf{x}|}e^{+ip^\mu x_\mu} = \frac{-|\mathbf{x}|}{t}e^{+ip^\mu x_\mu} \to \frac{t}{-|\mathbf{x}|}e^{+ip^\mu x_\mu} - \frac{-|\mathbf{x}|}{t}e^{+ip^\mu x_\mu} = 0 \\
\to \begin{pmatrix} t & -|\mathbf{x}| \\ -|\mathbf{x}| & t \end{pmatrix}\begin{pmatrix} a_{e,+}e^{+ip^\mu x_\mu} \\ a_{i,-}e^{+ip^\mu x_\mu} \end{pmatrix} = \begin{pmatrix} L_{M,e} & L_{M,i} \end{pmatrix}\begin{pmatrix} \psi_{e,+} \\ \psi_{i,-} \end{pmatrix} = L_M\psi = 0 \\
\to \begin{pmatrix} t & -\mathbf{S}\cdot\mathbf{X} \\ -\mathbf{S}\cdot\mathbf{X} & t \end{pmatrix}\begin{pmatrix} \mathbf{E}_{0e,+}e^{+ip^\mu x_\mu} \\ i\mathbf{B}_{0i,-}e^{+ip^\mu x_\mu} \end{pmatrix} = \begin{pmatrix} L_{M,e} & L_{M,i} \end{pmatrix}\begin{pmatrix} \psi_{e,+} \\ \psi_{i,-} \end{pmatrix} = L_M\psi_{photon} = 0
\end{gathered}
\tag{4.8}
$$

This photon wave function can be written as:

$$
\psi_{photon} = \begin{pmatrix} \psi_{e,+} \\ \psi_{i,-} \end{pmatrix} = \begin{pmatrix} \mathbf{E}_{(\mathbf{p},\,\mathrm{E})} \\ i\mathbf{B}_{(\mathbf{p},\,\mathrm{E})} \end{pmatrix} = \begin{pmatrix} \mathbf{E}_0 e^{+i(\omega t - \mathbf{k}\cdot\mathbf{x})} \\ i\mathbf{B}_0 e^{+i(\omega t - \mathbf{k}\cdot\mathbf{x})} \end{pmatrix} = \begin{pmatrix} \mathbf{E}_0 \\ i\mathbf{B}_0 \end{pmatrix} e^{+i(\omega t - \mathbf{k}\cdot\mathbf{x})} \tag{4.9}
$$

After the substitutions $t \to -i\partial_E$ and $\mathbf{x} \to i\nabla_p$, we have from the last expression in (4.8):

$$
\begin{pmatrix} i\partial_E & i\mathbf{S}\cdot\nabla_p \\ i\mathbf{S}\cdot\nabla_p & i\partial_E \end{pmatrix}\begin{pmatrix} \mathbf{E}_{(\mathbf{p},\,\mathrm{E})} \\ i\mathbf{B}_{(\mathbf{p},\,\mathrm{E})} \end{pmatrix} = 0 \to \begin{pmatrix} \partial_E\mathbf{E}_{(\mathbf{p},\,\mathrm{E})} = \nabla_p \times \mathbf{B}_{(\mathbf{p},\,\mathrm{E})} \\ \partial_E\mathbf{B}_{(\mathbf{p},\,\mathrm{E})} = -\nabla_p \times \mathbf{E}_{(\mathbf{p},\,\mathrm{E})} \end{pmatrix} \tag{4.10}
$$

where we have used the relationship $\mathbf{S}\cdot(i\nabla_p) = -\nabla_p \times$ to derive the latter equations which together with $\nabla_p \cdot \mathbf{E}_{(\mathbf{p},\,E)} = 0$ and $\nabla_p \cdot \mathbf{B}_{(\mathbf{p},\,E)} = 0$ are the Maxwell-like equations in the source-free vacuum in the dual momentum-energy universe.

Premomentumenergy model creates a neutrino in Dirac-like form by replacing the last step of expression (4.8) with the following:

$$\rightarrow \begin{pmatrix} t & -\sigma\cdot\mathbf{x} \\ -\sigma\cdot\mathbf{x} & t \end{pmatrix} \begin{pmatrix} a_{e,+}e^{+ip^{\mu}x_{\mu}} \\ a_{i,-}e^{+ip^{\mu}x_{\mu}} \end{pmatrix} = \begin{pmatrix} L_{M,e} & L_{M,i} \end{pmatrix} \begin{pmatrix} \psi_{e,+} \\ \psi_{i,-} \end{pmatrix} = L_M \psi = 0 \tag{4.11}$$

Premomentumenergy model creates, sustains and causes evolution of a linear plane-wave antiphoton as follows:

$$1 = e^{i0} = e^{i0}e^{i0} = e^{+iL-iL}e^{-iM+iM}$$

$$(\cos L - i\sin L)(\cos L + i\sin L)e^{-iM+iM} =$$

$$\left(\frac{0}{t} - i\frac{|\mathbf{x}|}{t}\right)\left(\frac{0}{t} + i\frac{|\mathbf{x}|}{t}\right)e^{-ip^{\mu}x_{\mu}+ip^{\mu}x_{\mu}}$$

$$= \left(+i\frac{|\mathbf{x}|}{t}\right)\left(-i\frac{|\mathbf{x}|}{t}\right)e^{-ip^{\mu}x_{\mu}+ip^{\mu}x_{\mu}}$$

$$\left(\frac{\mathbf{x}^2}{t^2}\right)e^{-ip^{\mu}x_{\mu}+ip^{\mu}x_{\mu}} = \left(\frac{t^2}{\mathbf{x}^2}\right)e^{-ip^{\mu}x_{\mu}+ip^{\mu}x_{\mu}} =$$

$$\left(\frac{t}{-|\mathbf{x}|}\right)\left(\frac{-|\mathbf{x}|}{t}\right)^{-1}\left(e^{-ip^{\mu}x_{\mu}}\right)\left(e^{-ip^{\mu}x_{\mu}}\right)^{-1} \rightarrow$$

$$\frac{t}{-|\mathbf{x}|}e^{-ip^{\mu}x_{\mu}} = \frac{-|\mathbf{x}|}{t}e^{-ip^{\mu}x_{\mu}} \rightarrow \frac{t}{-|\mathbf{x}|}e^{-ip^{\mu}x_{\mu}} - \frac{-|\mathbf{x}|}{t}e^{-ip^{\mu}x_{\mu}} = 0 \tag{4.12}$$

$$\rightarrow \begin{pmatrix} t & -|\mathbf{x}| \\ -|\mathbf{x}| & t \end{pmatrix} \begin{pmatrix} \psi_{e,-} \\ \psi_{i,+} \end{pmatrix} = \begin{pmatrix} L_{M,e} & L_{M,i} \end{pmatrix} \begin{pmatrix} \psi_{e,-} \\ \psi_{i,+} \end{pmatrix} = L_M \psi = 0$$

$$\rightarrow \begin{pmatrix} t & -\mathbf{s}\cdot\mathbf{x} \\ -\mathbf{s}\cdot\mathbf{x} & t \end{pmatrix} \begin{pmatrix} i\mathbf{B}_{0e,-}e^{-ip^{\mu}x_{\mu}} \\ \mathbf{E}_{0i,+}e^{-ip^{\mu}x_{\mu}} \end{pmatrix} = \begin{pmatrix} L_{M,e} & L_{M,i} \end{pmatrix} \begin{pmatrix} \psi_{e,-} \\ \psi_{i,+} \end{pmatrix} = L_M \psi_{antiphoton} = 0$$

This antiphoton wave function can also be written as:

$$\psi_{antiphoton} = \begin{pmatrix} \psi_{e,-} \\ \psi_{i,+} \end{pmatrix} = \begin{pmatrix} i\mathbf{B}_{(\mathbf{p},\mathrm{E})} \\ \mathbf{E}_{(\mathbf{p},\mathrm{E})} \end{pmatrix} = \begin{pmatrix} i\mathbf{B}_{\mathbf{0}} e^{-i(\omega t - \mathbf{k}\cdot\mathbf{x})} \\ \mathbf{E}_{\mathbf{0}} e^{-i(\omega t - \mathbf{k}\cdot\mathbf{x})} \end{pmatrix} = \begin{pmatrix} i\mathbf{B}_{\mathbf{0}} \\ \mathbf{E}_{\mathbf{0}} \end{pmatrix} e^{-i(\omega t - \mathbf{k}\cdot\mathbf{x})} \tag{4.13}$$

Premomentumenergy model creates an antineutrino in Dirac form by replacing the last step of expression (4.12) with the following:

$$\rightarrow \begin{pmatrix} t & -\sigma\cdot\mathbf{x} \\ -\sigma\cdot\mathbf{x} & t \end{pmatrix} \begin{pmatrix} a_{e,-} e^{-ip^{\mu}x_{\mu}} \\ a_{i,+} e^{-ip^{\mu}x_{\mu}} \end{pmatrix} = \begin{pmatrix} L_{M,e} & L_{M,i} \end{pmatrix} \begin{pmatrix} \psi_{e,-} \\ \psi_{i,+} \end{pmatrix} = L_M \psi = 0 \tag{4.14}$$

Similarly, premomentumenergy model creates and sustains momentumless (momentum independent) external and internal wave functions of an intrinsic-proper-time τ in Weyl-like (chiral-like) form as follows:

$$1 = e^{i0} = e^{i0} e^{i0} = e^{+iL-iL} e^{+iM-iM}$$

$$(\cos L + i \sin L)(\cos L - i \sin L) e^{+iM-iM} =$$

$$\left(\frac{\tau}{t} - i\frac{0}{t}\right)\left(\frac{\tau}{t} + i\frac{0}{t}\right) e^{+iEt-iEt}$$

$$= \left(\frac{\tau}{t}\right)\left(\frac{\tau}{t}\right) e^{+iEt-iEt}$$

$$\left(\frac{\tau^2}{t^2}\right) e^{+iEt-iEt} = \left(\frac{t^2}{\tau^2}\right) e^{+iEt-iEt} =$$

$$\left(\frac{t}{-\tau}\right)\left(\frac{-\tau}{t}\right)^{-1} \left(e^{+iEt}\right)\left(e^{+iEt}\right)^{-1} \rightarrow$$

$$\frac{t}{-\tau} e^{+iEt} = \frac{-\tau}{t} e^{+iEt} \rightarrow \frac{t}{-\tau} e^{+iEt} - \frac{-\tau}{t} e^{+iEt} = 0 \tag{4.15}$$

$$\rightarrow \begin{pmatrix} t & -\tau \\ -\tau & t \end{pmatrix} \begin{pmatrix} g_{W,e} e^{+iEt} \\ g_{W,i} e^{+iEt} \end{pmatrix} = \begin{pmatrix} L_{M,e} & L_{M,i} \end{pmatrix} \begin{pmatrix} V_{W,e} \\ V_{W,i} \end{pmatrix} = L_M V_W = 0$$

Premomentumenergy model creates, sustains and causes evolution of a momentumly self-confined entity such as a proton through imaginary position $\mathbf{x}_i$ (downward self-reference such that $\tau^2 > t^2$) in Dirac-like form in said dual universe comprised of said external energy-momentum space and said internal energy-momentum space as follows:

$$1 = e^{i0} = e^{i0}e^{i0} = e^{+iL-iL}e^{-iM+iM}$$

$$(\cos L + i\sin L)(\cos L - i\sin L)e^{-iM+iM} =$$

$$\left(\frac{\tau}{t} + i\frac{|\mathbf{x}_i|}{t}\right)\left(\frac{\tau}{t} - i\frac{|\mathbf{x}_i|}{t}\right)e^{-ip^\mu x_\mu + ip^\mu x_\mu}$$

$$= \left(\frac{\tau + i|\mathbf{x}_i|}{t}\right)\left(\frac{\tau - i|\mathbf{x}_i|}{t}\right)e^{-ip^\mu x_\mu + ip^\mu x_\mu}$$

$$= \left(\frac{\tau^2 + \mathbf{x}_i^{\,2}}{t^2}\right)e^{-ip^\mu x_\mu + ip^\mu x_\mu} = \frac{t^2 - \tau^2}{\mathbf{x}_i^{\,2}}e^{-ip^\mu x_\mu + ip^\mu x_\mu}$$

$$= \left(\frac{t-\tau}{-|\mathbf{x}_i|}\right)\left(\frac{-|\mathbf{x}_i|}{t+\tau}\right)^{-1}\left(e^{-ip^\mu x_\mu}\right)\left(e^{-ip^\mu x_\mu}\right)^{-1} \rightarrow$$

$$\frac{t-\tau}{-|\mathbf{x}_i|}e^{-ip^\mu x_\mu} = \frac{-|\mathbf{x}_i|}{t+\tau}e^{-ip^\mu x_\mu} \rightarrow \frac{t-\tau}{-|\mathbf{x}_i|}e^{-ip^\mu x_\mu} - \frac{-|\mathbf{x}_i|}{t+\tau}e^{-ip^\mu x_\mu} = 0$$

$$\rightarrow \begin{pmatrix} t-\tau & -|\mathbf{x}_i| \\ -|\mathbf{x}_i| & t+\tau \end{pmatrix}\begin{pmatrix} s_{e,-}e^{-iEt} \\ s_{i,+}e^{-iEt} \end{pmatrix} = \begin{pmatrix} L_{M,e} & L_{M,i} \end{pmatrix}\begin{pmatrix} \psi_{e,-} \\ \psi_{i,+} \end{pmatrix} = L_M\psi = 0 \qquad (4.16)$$

After spinization of the last expression in (4.16), we have:

$$\rightarrow \begin{pmatrix} t-\tau & -\boldsymbol{\sigma}\cdot\mathbf{x}_i \\ -\boldsymbol{\sigma}\cdot\mathbf{x}_i & t+\tau \end{pmatrix}\begin{pmatrix} S_{e,-}e^{-iEt} \\ S_{i,+}e^{-iEt} \end{pmatrix} = \begin{pmatrix} L_{M,e} & L_{M,i} \end{pmatrix}\begin{pmatrix} \psi_{e,-} \\ \psi_{i,+} \end{pmatrix} = L_M\psi = 0 \qquad (4.17)$$

As discussed previously, it is plausible that the last expression in (4.16) governs the confinement structure of the unspinized proton in Dirac-like form through imaginary position $\mathbf{x}_i$ and, on the other hand, expression (4.17) governs the confinement structure of spinized proton through $\mathbf{x}_i$.

Thus, an unspinized and spinized antiproton in Dirac-like form in said dual universe comprised of said external energy-momentum space and said internal energy-momentum space may be respectively governed as follows:

$$\begin{pmatrix} t-\tau & -|\mathbf{x}_i| \\ -|\mathbf{x}_i| & t+\tau \end{pmatrix}\begin{pmatrix} s_{e,+}e^{+iEt} \\ s_{i,-}e^{+iEt} \end{pmatrix} = \begin{pmatrix} L_{M,e} & L_{M,i} \end{pmatrix}\begin{pmatrix} \psi_{D,e} \\ \psi_{D,i} \end{pmatrix} = L_M \psi_D = 0 \tag{4.18}$$

$$\begin{pmatrix} t-\tau & -\sigma\cdot\mathbf{x}_i \\ -\sigma\cdot\mathbf{x}_i & t+\tau \end{pmatrix}\begin{pmatrix} S_{e,+}e^{+iEt} \\ S_{i,-}e^{+iEt} \end{pmatrix} = \begin{pmatrix} L_{M,e} & L_{M,i} \end{pmatrix}\begin{pmatrix} \psi_{D,e} \\ \psi_{D,i} \end{pmatrix} = L_M \psi_D = 0 \tag{4.19}$$

Similarly, premomentumenergy model creates, sustains and causes evolution of a momentumly self-confined entity such as a proton through imaginary position $\mathbf{x}_i$ (downward self-reference) in Weyl-like (chiral-like) form in said dual universe comprised of said external energy-momentum space and said internal energy-momentum space as follows:

$$1 = e^{i0} = e^{i0}e^{i0} = e^{+iL-iL}e^{-iM+iM}$$

$$(\cos L + i\sin L)(\cos L - i\sin L)e^{-iM+iM} =$$

$$\left(\frac{\tau}{t} + i\frac{|\mathbf{x}_i|}{t}\right)\left(\frac{\tau}{t} - i\frac{|\mathbf{x}_i|}{t}\right)e^{-ip^{\mu}x_{\mu}+ip^{\mu}x_{\mu}}$$

$$= \left(\frac{\tau + i|\mathbf{x}_i|}{t}\right)\left(\frac{\tau - i|\mathbf{x}_i|}{t}\right)e^{-ip^{\mu}x_{\mu}+ip^{\mu}x_{\mu}}$$

$$= \left(\frac{\tau^2 + \mathbf{x}_i{}^2}{t^2}\right)e^{-ip^{\mu}x_{\mu}+ip^{\mu}x_{\mu}} = \frac{t^2 - \mathbf{x}_i^2}{\tau^2}e^{-ip^{\mu}x_{\mu}+ip^{\mu}x_{\mu}} =$$

$$\left(\frac{t-|\mathbf{x}_i|}{-\tau}\right)\left(\frac{-\tau}{t+|\mathbf{x}_i|}\right)^{-1}\left(e^{-ip^{\mu}x_{\mu}}\right)\left(e^{-ip^{\mu}x_{\mu}}\right)^{-1} \rightarrow$$

$$\frac{t-|\mathbf{x}_i|}{-\tau}e^{-ip^{\mu}x_{\mu}} = \frac{-\tau}{t+|\mathbf{x}_i|}e^{-ip^{\mu}x_{\mu}} \rightarrow \frac{t-|\mathbf{x}_i|}{-\tau}e^{-ip^{\mu}x_{\mu}} - \frac{-\tau}{t+|\mathbf{x}_i|}e^{-ip^{\mu}x_{\mu}} = 0$$

$$\rightarrow \begin{pmatrix} t-|\mathbf{x}_i| & -\tau \\ -\tau & t+|\mathbf{x}_i| \end{pmatrix}\begin{pmatrix} s_{e,r}e^{-iEt} \\ s_{i,l}e^{-iEt} \end{pmatrix} = \begin{pmatrix} L_{M,e} & L_{M,i} \end{pmatrix}\begin{pmatrix} \psi_{e,r} \\ \psi_{i,l} \end{pmatrix} = L_M \psi = 0 \tag{4.20}$$

After spinization of expression (4.20), we have:

$$\rightarrow\begin{pmatrix} t-\boldsymbol{\sigma}\cdot\mathbf{x}_i & -\tau \\ -\tau & t+\boldsymbol{\sigma}\cdot\mathbf{x}_i \end{pmatrix}\begin{pmatrix} S_{e,r}e^{-iEt} \\ S_{i,l}e^{-iEt} \end{pmatrix}=\begin{pmatrix} L_{M,e} & L_{M,i} \end{pmatrix}\begin{pmatrix} \psi_{e,r} \\ \psi_{i,l} \end{pmatrix}=L_M\psi=0 \tag{4.21}$$

It is suggested that the last expression in (4.20) governs the structure of the unspinized proton in Weyl-like form and expression (4.21) governs the structure of spinized proton in Weyl-like form in said dual universe comprised of said external energy-momentum space and said internal energy-momentum space.

Thus, an unspinized and spinized antiproton in Weyl-like form in said dual universe comprised of said external energy-momentum space and said internal energy-momentum space may be respectively governed as follows:

$$\begin{pmatrix} t-|\mathbf{x}_i| & -\tau \\ -\tau & t+|\mathbf{x}_i| \end{pmatrix}\begin{pmatrix} s_{e,l}e^{+iEt} \\ s_{i,r}e^{+iEt} \end{pmatrix}=\begin{pmatrix} L_{M,e} & L_{M,i} \end{pmatrix}\begin{pmatrix} \psi_{e,l} \\ \psi_{i,r} \end{pmatrix}=L_M\psi=0 \tag{4.22}$$

$$\begin{pmatrix} t-\sigma\cdot\mathbf{x}_i & -\tau \\ -\tau & t+\sigma\cdot\mathbf{x}_i \end{pmatrix}\begin{pmatrix} S_{e,l}e^{+iEt} \\ S_{i,r}e^{+iEt} \end{pmatrix}=\begin{pmatrix} L_{M,e} & L_{M,i} \end{pmatrix}\begin{pmatrix} \psi_{e,l} \\ \psi_{i,r} \end{pmatrix}=L_M\psi=0 \tag{4.23}$$

4.2 Scientific Genesis of Composite Entities in the Premomentumenergy Model

Premomentumenergy creates, sustains and causes evolution of a neutron in Dirac-like form, in said dual universe comprised of said external energy-momentum space and said internal energy-momentum space, which is comprised of an unspinized proton:

$$\left(\begin{pmatrix} t-e\phi_{(\mathbf{p},E)}-\tau & -|\mathbf{x}_i-e\mathbf{A}_{(\mathbf{p},E)}| \\ -|\mathbf{x}_i-e\mathbf{A}_{(\mathbf{p},E)}| & t-e\phi_{(\mathbf{p},E)}+\tau \end{pmatrix}\begin{pmatrix} s_{e,-}e^{-iEt} \\ s_{i,+}e^{-iEt} \end{pmatrix}=0\right)_p \tag{4.24}$$

and a spinized electron:

$$\left(\begin{pmatrix} t+e\phi_{(\mathbf{p},E)}-V_{(\mathbf{p},E)}-\tau & -\boldsymbol{\sigma}\cdot(\mathbf{x}+e\mathbf{A}_{(\mathbf{p},E)}) \\ -\boldsymbol{\sigma}\cdot(\mathbf{p}+e\mathbf{A}_{(\mathbf{p},E)}) & t+e\phi_{(\mathbf{p},E)}-V_{(\mathbf{p},E)}+\tau \end{pmatrix}\begin{pmatrix} S_{e,+}e^{+iEt} \\ S_{i,-}e^{+iEt} \end{pmatrix}=0\right)_e \tag{4.25}$$

as follows:

$$1=e^{i0}=e^{i0}e^{i0}e^{i0}e^{i0}=\left(e^{i0}e^{i0}\right)_p\left(e^{i0}e^{i0}\right)_e=\left(e^{-iL+iM}e^{-iM+iM}\right)_p\left(e^{+iL-iL}e^{+iM-iM}\right)_e$$

$$=\left((\cos L-i\sin L)(\cos L+i\sin L)e^{-iM+iM}\right)_p\left((\cos L+i\sin L)(\cos L-i\sin L)e^{+iM-iM}\right)_e$$

$$=\left(\left(\frac{\tau}{t}+i\frac{|\mathbf{x}_i|}{t}\right)\left(\frac{\tau}{t}-i\frac{|\mathbf{x}_i|}{t}\right)e^{\substack{-ip^\mu x_\mu\\ =ip^\mu x_\mu}}\right)_p\left(\left(\frac{\tau}{t}-i\frac{|\mathbf{x}|}{t}\right)\left(\frac{\tau}{t}+i\frac{|\mathbf{x}|}{t}\right)e^{=ip^\mu x_\mu-ip^\mu x_\mu}\right)_e$$

$$=\left(\frac{t^2-\tau^2}{\mathbf{x}_i^2}e^{-ip^\mu x_\mu+ip^\mu x_\mu}\right)_p\left(\frac{t^2-\tau^2}{\mathbf{x}^2}e^{+ip^\mu x_\mu-ip^\mu x_\mu}\right)_e=$$

$$\left(\left(\frac{t-\tau}{-|\mathbf{x}_i|}\right)\left(\frac{-|\mathbf{x}_i|}{t+\tau}\right)^{-1}\left(e^{-ip^\mu x_\mu}\right)\left(e^{-ip^\mu x_\mu}\right)^{-1}\right)_p\left(\left(\frac{t-\tau}{-|\mathbf{x}|}\right)\left(\frac{-|\mathbf{x}|}{t+\tau}\right)^{-1}\left(e^{+ip^\mu x_\mu}\right)\left(e^{+ip^\mu x_\mu}\right)^{-1}\right)_e$$

$$\rightarrow\left(\begin{pmatrix}t-\tau & -|\mathbf{x}_i|\\ -|\mathbf{x}_i| & t+\tau\end{pmatrix}\begin{pmatrix}s_{e,-}e^{-iEt}\\ s_{i,+}e^{-iEt}\end{pmatrix}=0\right)_p\left(\begin{pmatrix}t-\tau & -|\mathbf{x}|\\ -|\mathbf{x}| & t+\tau\end{pmatrix}\begin{pmatrix}s_{e,+}e^{+iEt}\\ s_{i,-}e^{+iEt}\end{pmatrix}=0\right)_e$$

$$\rightarrow\begin{pmatrix}\left(\begin{pmatrix}t-e\phi_{(\mathbf{p},E)}-\tau & -|\mathbf{x}_i-e\mathbf{A}_{(\mathbf{p},E)}|\\ -|\mathbf{x}_i-e\mathbf{A}_{(\mathbf{p},E)}| & t-e\phi_{(\mathbf{p},E)}+\tau\end{pmatrix}\begin{pmatrix}s_{e,-}e^{-iEt}\\ s_{i,+}e^{-iEt}\end{pmatrix}=0\right)_p\\ \left(\begin{pmatrix}t+e\phi_{(\mathbf{p},E)}-V_{(\mathbf{p},E)}-\tau & -\boldsymbol{\sigma}\cdot(\mathbf{x}+e\mathbf{A}_{(\mathbf{p},E)})\\ -\boldsymbol{\sigma}\cdot(\mathbf{x}+e\mathbf{A}_{(\mathbf{p},E)}) & t+e\phi_{(\mathbf{p},E)}-V_{(\mathbf{p},E)}+\tau\end{pmatrix}\begin{pmatrix}S_{e,+}e^{+iEt}\\ S_{i,-}e^{+iEt}\end{pmatrix}=0\right)_e\end{pmatrix}_n \quad (4.26)$$

In expressions (4.24), (4.25) and (4.26), $(\ )_p$, $(\ )_e$ and $(\ )_n$ indicate proton, electron and neutron respectively. Further, unspinized proton has charge e, electron has charge –e, $\left(A^\mu=(\phi_{(\mathbf{p},E)},\mathbf{A}_{(\mathbf{p},E)})\right)_p$ and $\left(A^\mu=(\phi_{(\mathbf{p},E)},\mathbf{A}_{(\mathbf{p},E)})\right)_e$ are the electromagnetic potentials acting on unspinized proton and tightly bound spinized electron respectively, and $\left(V_{(\mathbf{p}.E)}\right)_e$ is a binding potential from the unspinized proton acting on the spinized electron causing tight binding as discussed later.

If $\left(A^\mu=(\phi_{(\mathbf{p},E)},\mathbf{A}_{(\mathbf{p},E)})\right)_p$ is negligible due to the fast motion of the tightly bound spinized electron, we have from the last expression in (4.26):

$$\rightarrow\begin{pmatrix}\left(\begin{pmatrix} t-\tau & -|\mathbf{x}_i| \\ -|\mathbf{x}_i| & t+\tau \end{pmatrix}\begin{pmatrix} s_{e,-}e^{-iEt} \\ s_{i,+}e^{-iEt}\end{pmatrix}=0\right)_p \\ \left(\begin{pmatrix} t+e\phi_{(\mathbf{p},E)}V_{(\mathbf{p},E)}-\tau & -\boldsymbol{\sigma}\cdot(\mathbf{x}+e\mathbf{A}_{(\mathbf{p},E)}) \\ -\boldsymbol{\sigma}\cdot(\mathbf{x}+e\mathbf{A}_{(\mathbf{p},E)}) & t+e\phi_{(\mathbf{p},E)}V_{(\mathbf{p},E)}+\tau \end{pmatrix}\begin{pmatrix} S_{e,+}e^{+iEt} \\ S_{i,-}e^{+iEt}\end{pmatrix}=0\right)_e\end{pmatrix}_n \tag{4.27}$$

Experimental data on charge distribution and *g*-factor of neutron seem to support a neutron comprising of an unspinized proton and a tightly bound spinized electron.

The Weyl-like (chiral-like) form of the last expression in (4.26) and expression (4.27) are respectively as follows:

$$\begin{pmatrix}\left(\begin{pmatrix} t-e\phi_{(\mathbf{p},E)}-|\mathbf{x}_i-e\mathbf{A}_{(\mathbf{p},E)}| & -\tau \\ -\tau & -e\phi+|\mathbf{x}_i-e\mathbf{A}_{(\mathbf{p},E)}| \end{pmatrix}\begin{pmatrix} s_{e,r}e^{-iEt} \\ s_{i,l}e^{-iEt}\end{pmatrix}=0\right)_p \\ \left(\begin{pmatrix} t+e\phi_{(\mathbf{p},E)}-V_{(\mathbf{p},E)}-\boldsymbol{\sigma}\cdot(\mathbf{p}+e\mathbf{A}_{(\mathbf{p},E)}) & -\tau \\ -\tau & t+e\phi_{(\mathbf{p},E)}-V_{(\mathbf{p},E)}+\boldsymbol{\sigma}\cdot(\mathbf{p}+e\mathbf{A}_{(\mathbf{p},E)}) \end{pmatrix}\begin{pmatrix} S_{e,l}e^{+iEt} \\ S_{i,r}e^{+iEt}\end{pmatrix}=0\right)_e\end{pmatrix}_n \tag{4.28}$$

$$\begin{pmatrix}\left(\begin{pmatrix} t-|\mathbf{x}_i| & -\tau \\ -\tau & t+|\mathbf{x}_i| \end{pmatrix}\begin{pmatrix} s_{e,r}e^{-iEt} \\ s_{i,l}e^{-iEt}\end{pmatrix}=0\right)_p \\ \left(\begin{pmatrix} t+e\phi_{(\mathbf{p},E)}-V_{(\mathbf{p},E)}-\boldsymbol{\sigma}\cdot(\mathbf{x}+e\mathbf{A}_{(\mathbf{p},E)}) & -\tau \\ -\tau & t+e\phi_{(\mathbf{p},E)}-V_{(\mathbf{p},E)}+\boldsymbol{\sigma}\cdot(\mathbf{x}+e\mathbf{A}_{(\mathbf{p},E)}) \end{pmatrix}\begin{pmatrix} S_{e,l}e^{+iEt} \\ S_{i,r}e^{+iEt}\end{pmatrix}=0\right)_e\end{pmatrix}_n \tag{4.29}$$

Premomentumenergy creates, sustains and causes evolution of a hydrogen atom, in said dual universe comprised of said external energy-momentum space and said internal energy-momentum space, comprising of a spinized proton:

$$\left(\begin{pmatrix} t-e\phi_{(\mathbf{p},E)}-\tau & -\sigma\cdot(\mathbf{x}_i-e\mathrm{A}_{(\mathbf{p},E)}) \\ -\sigma\cdot(\mathbf{x}_i-e\mathbf{A}_{(\mathbf{p},E)}) & t-e\phi_{(\mathbf{p},E)}+\tau \end{pmatrix}\begin{pmatrix} S_{e,-}e^{-iEt} \\ S_{i,+}e^{-iEt}\end{pmatrix}=0\right)_p \tag{4.30}$$

and a spinized electron:

$$\left(\begin{pmatrix} t+e\phi_{(\mathbf{p},E)}-\tau & -\boldsymbol{\sigma}\cdot(\mathbf{x}+e\mathbf{A}_{(\mathbf{p},E)}) \\ -\boldsymbol{\sigma}\cdot(\mathbf{x}+e\mathbf{A}_{(\mathbf{p},E)}) & t+e\phi_{(\mathbf{p},E)}+\tau \end{pmatrix}\begin{pmatrix} S_{e,+}e^{+iEt} \\ S_{i,-}e^{+iEt}\end{pmatrix}=0\right)_e \tag{4.31}$$

in Dirac-like form as follows:

$$1=e^{i0}=e^{i0}e^{i0}e^{i0}e^{i0}=\left(e^{i0}e^{i0}\right)_p\left(e^{i0}e^{i0}\right)_e=\left(e^{-iL+iM}e^{-iM+iM}\right)_p\left(e^{+iL-iL}e^{+iM-iM}\right)_e$$

$$=\left((\cos L-i\sin L)(\cos L+i\sin L)e^{-iM+iM}\right)_p\left((\cos L+i\sin L)(\cos L-i\sin L)e^{+iM-iM}\right)_e$$

$$=\left(\left(\frac{\tau}{t}+i\frac{|\mathbf{x}_i|}{t}\right)\left(\frac{\tau}{t}-i\frac{|\mathbf{x}_i|}{t}\right)e^{\substack{-ip^\mu x_\mu\\ =ip^\mu x_\mu}}\right)_p\left(\left(\frac{\tau}{t}-i\frac{|\mathbf{x}|}{t}\right)\left(\frac{\tau}{t}+i\frac{|\mathbf{x}|}{t}\right)e^{=ip^\mu x_\mu-ip^\mu x_\mu}\right)_e$$

$$=\left(\frac{t^2-\tau^2}{\mathbf{x}_i^2}e^{-ip^\mu x_\mu+ip^\mu x_\mu}\right)_p\left(\frac{t^2-\tau^2}{\mathbf{x}^2}e^{+ip^\mu x_\mu-ip^\mu x_\mu}\right)_e=$$

$$\left(\left(\frac{t-\tau}{-|\mathbf{x}_i|}\right)\left(\frac{-|\mathbf{x}_i|}{t+\tau}\right)^{-1}\left(e^{-ip^\mu x_\mu}\right)\left(e^{-ip^\mu x_\mu}\right)^{-1}\right)_p\left(\left(\frac{t-\tau}{-|\mathbf{x}|}\right)\left(\frac{-|\mathbf{x}|}{t+\tau}\right)^{-1}\left(e^{+ip^\mu x_\mu}\right)\left(e^{+ip^\mu x_\mu}\right)^{-1}\right)_e$$

$$\rightarrow\left(\begin{pmatrix}t-\tau & -|\mathbf{x}_i|\\ -|\mathbf{x}_i| & t+\tau\end{pmatrix}\begin{pmatrix}s_{e,-}e^{-iEt}\\ s_{i,+}e^{-iEt}\end{pmatrix}=0\right)_p\left(\begin{pmatrix}t-\tau & -|\mathbf{x}|\\ -|\mathbf{x}| & t+\tau\end{pmatrix}\begin{pmatrix}s_{e,+}e^{+iEt}\\ s_{i,-}e^{+iEt}\end{pmatrix}=0\right)_e$$

$$\rightarrow\begin{pmatrix}\left(\begin{pmatrix}t-e\phi_{(\mathsf{p},E)}-\tau & -\boldsymbol{\sigma}\cdot(\mathbf{x}_i-e\mathbf{A}_{(\mathsf{p},E)})\\ -\boldsymbol{\sigma}\cdot(\mathbf{x}_i-e\mathbf{A}_{(\mathsf{p},E)}) & t-e\phi_{(\mathsf{p},E)}+\tau\end{pmatrix}\begin{pmatrix}S_{e,-}e^{-iEt}\\ S_{i,+}e^{-iEt}\end{pmatrix}=0\right)_p\\ \left(\begin{pmatrix}t+e\phi_{(\mathsf{p},E)}-\tau & -\boldsymbol{\sigma}\cdot(\mathbf{x}+e\mathbf{A}_{(\mathsf{p},E)})\\ -\boldsymbol{\sigma}\cdot(\mathbf{x}+e\mathbf{A}_{(\mathsf{p},E)}) & t+e\phi_{(\mathsf{p},E)}+\tau\end{pmatrix}\begin{pmatrix}S_{e,+}e^{+iEt}\\ S_{i,-}e^{+iEt}\end{pmatrix}=0\right)_e\end{pmatrix}_h \quad (4.32)$$

In expressions (4.30), (4.31) and (4.32), $(\ )_p$, $(\ )_e$ and $(\ )_h$ indicate proton, electron and hydrogen atom respectively. Again, proton has charge e, electron has charge –e, and $\left(A^\mu=(\phi_{(\mathsf{p},E)},\mathbf{A}_{(\mathsf{p},E)})\right)_p$ and $\left(A^\mu=(\phi_{(\mathsf{p},E)},\mathbf{A}_{(\mathsf{p},E)})\right)_e$ are the electromagnetic potentials acting on spinized proton and spinized electron respectively.

Again, if $\left(A^\mu=(\phi_{(\mathsf{p},E)},\mathbf{A}_{(\mathsf{p},E)})\right)_p$ is negligible due to fast motion of the orbiting spinized electron, we have from the last expression in (3.129):

$$\rightarrow \begin{pmatrix} \left(\begin{pmatrix} t-\tau & -\boldsymbol{\sigma}\cdot\mathbf{x}_i \\ -\boldsymbol{\sigma}\cdot\mathbf{x}_i & t+\tau \end{pmatrix} \begin{pmatrix} S_{e,-}e^{-iEt} \\ S_{i,+}e^{-iEt} \end{pmatrix} = 0 \right)_p \\ \left(\begin{pmatrix} t+e\phi_{(\mathbf{p},E)}-\tau & -\boldsymbol{\sigma}\cdot(\mathbf{x}+e\mathbf{A}_{(\mathbf{p},E)}) \\ -\boldsymbol{\sigma}\cdot(\mathbf{x}+e\mathbf{A}_{(\mathbf{p},E)}) & t+e\phi_{(\mathbf{p},E)}+\tau \end{pmatrix} \begin{pmatrix} S_{e,+}e^{+iEt} \\ S_{i,-}e^{+iEt} \end{pmatrix} = 0 \right)_e \end{pmatrix}_h \tag{4.33}$$

The Weyl-like (chiral-like) form of the last expression in (4.32) and expression (4.33) are respectively as follows:

$$\begin{pmatrix} \left(\begin{pmatrix} t-e\phi_{(\mathbf{p},E)}-\boldsymbol{\sigma}\cdot(\mathbf{x}_i-e\mathbf{A}_{(\mathbf{p},E)}) & -\tau \\ -\tau & t-e\phi_{(\mathbf{p},E)}+\boldsymbol{\sigma}\cdot(\mathbf{x}_i-e\mathbf{A}_{(\mathbf{p},E)}) \end{pmatrix} \begin{pmatrix} S_{e,r}e^{-iEt} \\ S_{i,l}e^{-iEt} \end{pmatrix} = 0 \right)_p \\ \left(\begin{pmatrix} t+e\phi_{(\mathbf{p},E)}-\boldsymbol{\sigma}\cdot(\mathbf{x}+e\mathbf{A}_{(\mathbf{p},E)}) & -\tau \\ -\tau & t+e\phi_{(\mathbf{p},E)}+\boldsymbol{\sigma}\cdot(\mathbf{x}+e\mathbf{A}_{(\mathbf{p},E)}) \end{pmatrix} \begin{pmatrix} S_{e,l}e^{+iEt} \\ S_{i,r}e^{+iEt} \end{pmatrix} = 0 \right)_e \end{pmatrix}_h \tag{4.34}$$

$$\begin{pmatrix} \left(\begin{pmatrix} t-\boldsymbol{\sigma}\cdot\mathbf{x}_i & -\tau \\ -\tau & t+\boldsymbol{\sigma}\cdot\mathbf{x}_i \end{pmatrix} \begin{pmatrix} S_{e,r}e^{-iEt} \\ S_{i,l}e^{-iEt} \end{pmatrix} = 0 \right)_p \\ \left(\begin{pmatrix} t+e\phi_{(\mathbf{p},E)}-\boldsymbol{\sigma}\cdot(\mathbf{x}+e\mathbf{A}_{(\mathbf{p},E)}) & -\tau \\ -\tau & t+e\phi_{(\mathbf{p},E)}+\boldsymbol{\sigma}\cdot(\mathbf{x}+e\mathbf{A}_{(\mathbf{p},E)}) \end{pmatrix} \begin{pmatrix} S_{e,l}e^{+iEt} \\ S_{i,r}e^{+iEt} \end{pmatrix} = 0 \right)_e \end{pmatrix}_h \tag{4.35}$$

5. Mathematics & Ontology of Ether

Ether is Mathematical, Immanent & Transcendental

5.1 Mathematical Aspect of Ether

In the premomentumenergy model, it is our comprehension that:

(1) The mathematical representation of the primordial ether in premomentumenergy is the Euler's Number *e* which makes the Euler's identity possible:

$$e^{i\pi}+1=0 \tag{5.1}$$

(2) Euler's Number e is the foundation of primordial distinction in premomentumenergy:

$$1=e^{i0}=e^{i0}e^{i0}=e^{+iL-iL}e^{+iM-iM}=e^{+iL}e^{-iM}e^{+iL}e^{-iM}=e^{+iL}e^{+iM}/e^{+iL}e^{+iM}\ \ldots \tag{5.2}$$

(3) Euler's Number *e* is the foundation of the genesis of time, position & intrinsic-proper-time relation in premomentumenergy:

$$\begin{gathered} 1=e^{i0}=e^{-iL+iL}=L_eL_i^{-1}=(\cos L-i\sin L)(\cos L+i\sin L)= \\ \left(\frac{\tau}{t}-i\frac{|\mathbf{x}|}{t}\right)\left(\frac{\tau}{t}+i\frac{|\mathbf{x}|}{t}\right)=\left(\frac{\tau-i|\mathbf{x}|}{t}\right)\left(\frac{\tau+i|\mathbf{x}|}{t}\right)=\left(\frac{\tau^2+\mathbf{x}^2}{t^2}\right)\rightarrow \end{gathered} \tag{5.3}$$

$$t^2=\tau^2+\mathbf{x}^2 \text{ where c = 1, that is, } (ct)^2=(c\tau)^2+\mathbf{x}^2$$

(4) Euler's Number *e* is the foundation of the genesis, sustenance and evolution of an elementary particle in premomentumenergy:

$$\begin{gathered} 1=e^{i0}=e^{i0}e^{i0}=e^{-iL+iL}e^{+iM-iM}=L_eL_i^{-1}\left(e^{+iM}\right)\left(e^{+iM}\right)^{-1}\rightarrow \\ \begin{pmatrix} L_{M,e} & L_{M,i} \end{pmatrix}\begin{pmatrix} A_e e^{+iM} \\ A_i e^{+iM} \end{pmatrix}=L_M\begin{pmatrix} A_e \\ A_i \end{pmatrix}e^{+iM}=L_M\begin{pmatrix} \psi_e \\ \psi_i \end{pmatrix}=L_M\psi=0 \end{gathered} \tag{5.4}$$

(5) Euler's Number *e* is also the foundation of quantum entanglement (gravity) in premomentumenergy.

(6) Euler's Number *e* is immanent in the sense that it is the ingredient of equations (5.1) to (5.5) thus all "knowing" and all "present."

(7) Euler's Number *e* is also transcendental in the sense that is the foundation of existence thus "omnipotent" and behind creation.

5.2 Immanent Aspect of Ether

In the premomentumenergy model, the immanent aspect of ether associated with individual entities in the dual momentum-energy universe ("i-ether") has following attributes:

i-ether is the ingredient of atoms, molecules, cells, a body;
i-ether is in momentum, energy, motion, rest;
i-ether is governed by the matrix laws of physics, chemistry, biology;
i-ether is the ingredient of this world, the Earth, the Solar System.

i-ether is the ingredient of awareness, feeling, imagination, free will;

i-ether is in love, passion, hope, despair;
i-ether is governed by the laws of psychology, economics, sociology;
i-ether is the ingredient of mind, soul, spirit.

In the premomentumenergy model, the immanent of ether associated with the Universal Entity ("I-ETHER") in the dual momentum-energy universe has following attributes:

I-ETHER IS atoms, molecules, cells, body;
I-ETHER IS momentum, energy, motion, rest;
I-ETHER IS laws of physics, chemistry, biology, physiology;
I-ETHER IS this World, the Earth, the Solar System;

I-ETHER IS awareness, feeling, imagination, free will;
I-ETHER IS love, passion, hope, despair;
I-ETHER IS the laws of psychology, economics, sociology;
I-ETHER IS mind, soul, spirit.

5.3 Transcendental Aspect of Ether

In the premomentumenergy model, the transcendental aspect of ether associated with individual entity ("t-ether") in the dual momentum-energy universe has following attributes:

t-ether is not the ingredient of atoms, of molecules, of cells, of a body;
t-ether is not in momentum, energy, motion, rest;
t-ether is not governed by the laws of physics, chemistry, biology;
t-ether is not the ingredient of this world, the Earth, the Solar System.

t-ether is beyond awareness, feeling, imagination, free will;
t-ether is beyond love, passion, hope, despair;
t-ether is beyond the laws of psychology, economics, sociology;
t-ether is beyond mind, soul, spirit.

In the premomentumenergy model, the transcendental aspect of ether associated with the Universal Entity ("T-ETHER") in the dual momentum-energy universe has following attributes:

T-ETHER IS NOT the atoms, molecules, cells, body;
T-ETHER IS NOT the momentum, energy, motion, rest;
T-ETHER IS NOT the laws of physics, chemistry, biology;
T-ETHER IS NOT this world, the Earth, the Solar System;

T-ETHER IS NOT awareness, feeling, imagination, free will;

T-ETHER IS NOT love, passion, hope, despair;
T-ETHER IS NOT the laws of psychology, economics, sociology;
T-ETHER IS NOT mind, soul, spirit.

6. Conclusion

This work is a continuation of the premomentumenergy model described recently [1]. Here we have shown how in this model premomentumenergy generates: (1) time, position, & intrinsic-proper-time relation from transcendental Law of One, (2) self-referential matrix law with time, position and intrinsic-proper-time relation as the determinant, (3) dual-universe Law of Zero, and (4) immanent Law of Conservation in the external/internal momentum-energy space which may be violated in certain processes. We have further shown how premomentum-energy generates, sustain and makes evolving elementary particles and composite particles incorporating the genesis of self-referential matrix law. In addition, we have discussed the ontology and mathematics of ether in this model.

Illustratively, in the beginning there was premomentumenergy by itself $e^{i0}=1$ materially empty and it began to imagine through primordial self-referential spin $1=e^{i0}=e^{i0}e^{i0}=e^{+iL-iL}e^{+iM-iM}=e^{+iL}e^{-iM}e^{+iL}e^{-iM}=e^{+iL}e^{+iM}/e^{+iL}e^{+iM}$ …such that it created the self-referential matrix law, the external object to be observed and internal object as observed, separated them into external momentum-energy space and internal momeutm-energy space, caused them to interact through said matrix law and thus gave birth to the dual universe (quantum frame) comprised of the external momentum-energy space and the internal momentum-energy space which it has since sustained and made to evolve.

The premomentumenergy model employs the following ontological principles among others:

(1) Principle of oneness/unity of existence through quantum entanglement in the ether of premomentumenergy.

(2) Principle of hierarchical primordial self-referential spin creating:
- time, position and intrinsic-proper-time relation as transcendental Law of One.
- time, position and intrinsic-proper-time relation as determinant of matrix law.
- Dual-universe Law of Zero of time, position and intrinsic-proper-time.
- Immanent Law of Conservation of time, position and intrinsic-proper-time in external/internal momentum-energy space which may be violated in certain processes.

Further, premomentumenergy model employs the following mathematical elements & forms among others in order to empower the above ontological principles:

(3) *e*, Euler's Number, for (to empower) ether as foundation/basis/medium

of existence (body of premomentumenergy);
(4) *i*, imaginary number, for (to empower) thoughts and imagination in premomemtumenergy (ether);
(3) 0, zero, for (to empower) emptiness (undifferentiated/primordial state);
(4) 1, one, for (to empower) oneness/unity of existence;
(5) +, -, *, /, = for (to empower) creation, dynamics, balance & conservation;
(6) Pythagorean Theorem for (to empower) time, position and intrinsic proper time relation; and
(7) *M*, matrix, for (to empower) the external and internal momentum-energy space and the interaction of external and internal wavefunctions (objects).

References

1. Hu, H. & Wu, M. (2010), Prespacetime Model of Elementary Particles, Four Forces & Consciousness. *Prespacetime journal 1:1, pp. 77-146*. Also see: http://vixra.org/abs/1001.0011

2. Hu, H. & Wu, M. (2010), Prespacetime Model II: Genesis of Self-Referential Matrix Law, & the Ontology & Mathematics of Ether. *Prespacetime journal 1:10, pp. 1477-1507*. Also see: http://vixra.org/abs/1012.0043

3. Hu, H. & Wu, M. (2013), Application of Prespacetime Model I. *Prespacetime journal 4:6, pp. 641-660.*

4. Hu, H. & Wu, M. (2013), Application of Prespacetime Model II. *Prespacetime journal 4:6, pp. 661-680.*

5. Hu, H. & Wu, M. (2014), Premomentumenergy Model I: Generation of Relativistic QM for a Dual Momentum-Energy Universe. *Prespacetime Journal*, 5(11): pp. 1042-1110.