Review Article

Modeling Methods Based on Premomentumenergy Model

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ABSTRACT

Some modeling methods based on premomentumenergy model are stated. The methods relate to presenting and modeling generation, sustenance and evolution of elementary particles through self-referential hierarchical spin structures of premomentumenergy. In particular, stated are methods for generating, sustaining and causing evolution of fermions, bosons and spinless particles in a dual universe (quantum frame) comprised of an external momentumenergy space and an internal momentumenergy space. Further, methods for modeling weak interaction, strong interaction, electromagnetic interaction, gravitational interaction, quantum entanglement and brain function in said dual universe are also stated.

Some additional modeling methods based on premomentumenergy model are also stated. The additional methods relate to presenting and modeling time, position & intrinsic-proper-time relation, self-referential matrix rules, elementary particles and composite particles through self-referential hierarchical spin in premomentumenergy. In particular, methods for generating time, position & intrinsic-proper-time relation, self-referential matrix rules, elementary particles and composite particles in aforesaid dual universe are stated.

Key Words: premomentumenergy, spin, self-reference, elementary particule, fermion, boson, unspinized particle, generation, sustenance, evolution, time-position relation.

1. Modeling Method Based on Premomentumenergy Model I

(1) A method of modeling generation, sustenance and evolution of an elementary particle through hierarchical self-referential spin in premomentumenergy, as a teaching and/or modeling tool, comprising the steps of:

producing a first representation of said generation, sustenance and evolution of said elementary particle through said hierarchical self-referential spin in said premomentumenergy, said representation comprising:

$$1 = e^{i0} = 1e^{i0} = Le^{+iM-iM} = L_e L_i^{-1}\left(e^{+iM}\right)\left(e^{+iM}\right)^{-1} \rightarrow$$

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$$\begin{pmatrix} L_{M,e} & L_{M,i} \end{pmatrix} \begin{pmatrix} A_e e^{+iM} \\ A_i e^{+iM} \end{pmatrix} = L_M \begin{pmatrix} \psi_e \\ \psi_i \end{pmatrix} = 0$$

where e is natural exponential base, i is imaginary unit, L represents rule of one, M is a phase, $A_e e^{-iM} = \psi_e$ represents external object, $A_i e^{-iM} = \psi_i$ represents internal object, L_e represents external rule, L_i represents internal rule, $L_M = (L_{M,e}\ L_{M,i})$ represents matrix rule, $L_{M,e}$ represents external matrix rule and $L_{M,i}$ represents internal matrix rule; and

presenting and/or modeling said first representation in a device for teaching and/or research.

(2) A method as in (1) wherein said external object comprises of an external wave function in external energy-momentum space; said internal object comprises of an internal wave function in internal energy-momentum space; said elementary particle comprises of a fermion, boson or unspinized particle in a dual energy-momentum universe comprising said external energy-momentum space and said internal energy-momentum space; said matrix rule contains a time operator $t \to -i\partial_E$, position operator $\mathbf{x} \to i\nabla$, spin operator $\boldsymbol{\sigma}$ where $\boldsymbol{\sigma} = (\sigma_1, \sigma_2, \sigma_3)$ are Pauli matrices, spin operator $\mathbf{S}$ where $\mathbf{S} = (s_1, s_2, s_3)$ are spin 1 matrices, and/or intrinsic proper time associated with said elementary particle; said matrix rule further has a determinant containing $t^2 - \boldsymbol{x}^2 - \tau^2 = 0$, $t^2 - \boldsymbol{x}^2 = 0$, $t^2 - \tau^2 = 0$, or $0^2 - \boldsymbol{x}^2 - \tau^2 = 0$; $c=1$ where c is speed of light; and $\hbar=1$ where $\hbar$ is reduced Planck constant.

(3) A method as in (2) wherein formation of said matrix rule in said first representation comprises:

$$\to 1 = L = \frac{t^2-\tau^2}{\mathbf{x}^2} = \left(\frac{t-\tau}{-|\mathbf{x}|}\right)\left(\frac{-\mathbf{x}}{t+\tau}\right)^{-1} \to \frac{t-\tau}{-|\mathbf{x}|} = \frac{-|\mathbf{x}|}{t+\tau} \to \frac{t-\tau}{-|\mathbf{x}|} - \frac{-|\mathbf{x}|}{t+\tau} = 0$$

$$\to \begin{pmatrix} t-\tau & -|\mathbf{x}| \\ -|\mathbf{x}| & t+\tau \end{pmatrix} \to \begin{pmatrix} t-\tau & -\boldsymbol{\sigma}\cdot\mathbf{x} \\ -\boldsymbol{\sigma}\cdot\mathbf{x} & t+\tau \end{pmatrix} \text{ or } \begin{pmatrix} t-\tau & -\mathbf{S}\cdot\mathbf{x} \\ -\mathbf{S}\cdot\mathbf{x} & t+\tau \end{pmatrix},$$

$$\to 1 = L = \frac{t^2-\mathbf{x}^2}{\tau^2} = \left(\frac{t-|\mathbf{x}|}{-\tau}\right)\left(\frac{-\tau}{t+|\mathbf{x}|}\right)^{-1} \to \frac{t-|\mathbf{x}|}{-\tau} = \frac{-\tau}{t+|\mathbf{x}|} \to \frac{t-|\mathbf{x}|}{-\tau} - \frac{-\tau}{t+|\mathbf{x}|} = 0$$

$$\to \begin{pmatrix} t-|\mathbf{x}| & -\tau \\ -\tau & t+|\mathbf{x}| \end{pmatrix} \to \begin{pmatrix} t-\boldsymbol{\sigma}\cdot\mathbf{x} & -\tau \\ -\tau & t+\boldsymbol{\sigma}\cdot\mathbf{x} \end{pmatrix} \text{ or } \begin{pmatrix} t-\mathbf{S}\cdot\mathbf{x} & -\tau \\ -\tau & t+\mathbf{S}\cdot\mathbf{x} \end{pmatrix},$$

$$\to 1 = L = \frac{\tau^2 + \mathbf{x}^2}{t^2} = \left(\frac{t}{-\tau + i|\mathbf{x}|}\right)^{-1}\left(\frac{-\tau - i|\mathbf{x}|}{t}\right)$$

$$\to \frac{t}{-\tau + i|\mathbf{x}|} = \frac{-\tau - i|\mathbf{x}|}{t} \to \frac{t}{-\tau + i|\mathbf{x}|} - \frac{-\tau - i|\mathbf{x}|}{t} = 0$$

$$\to \begin{pmatrix} t & -\tau - i|\mathbf{x}| \\ -\tau + i|\mathbf{x}| & t \end{pmatrix} \to \begin{pmatrix} t & -\tau - i\boldsymbol{\sigma}\cdot\mathbf{x} \\ -\tau + i\boldsymbol{\sigma}\cdot\mathbf{x} & t \end{pmatrix} \text{ or } \begin{pmatrix} t & -\tau - i\mathbf{s}\cdot\mathbf{x} \\ -\tau + i\mathbf{s}\cdot\mathbf{x} & t \end{pmatrix}, \text{ or}$$

$$\to 1 = L = \frac{t^2 - \mathbf{x}_i^{\,2}}{\tau^2} = \left(\frac{t - |\mathbf{x}_i|}{-\tau}\right)\left(\frac{-\tau}{t + |\mathbf{x}_i|}\right)^{-1} \to \frac{t - |\mathbf{x}_i|}{-\tau} = \frac{-\tau}{t + |\mathbf{x}_i|} \to \frac{t - |\mathbf{x}_i|}{-\tau} - \frac{-\tau}{t + |\mathbf{x}_i|} = 0$$

$$\to \begin{pmatrix} t - |\mathbf{x}_i| & -\tau \\ -\tau & t + |\mathbf{x}_i| \end{pmatrix} \to \begin{pmatrix} t - \boldsymbol{\sigma}\cdot\mathbf{x}_i & -\tau \\ -\tau & t + \boldsymbol{\sigma}\cdot\mathbf{x}_i \end{pmatrix} \text{ or } \begin{pmatrix} t - \mathbf{s}\cdot\mathbf{x}_i & -\tau \\ -\tau & t + \mathbf{s}\cdot\mathbf{x}_i \end{pmatrix},$$

where $\boldsymbol{\sigma} = (\sigma_1, \sigma_2, \sigma_3)$ are Pauli matrices, $|\mathbf{x}| = \sqrt{\mathbf{x}^2} = \sqrt{-Det(\boldsymbol{\sigma}\cdot\mathbf{x})} \to \boldsymbol{\sigma}\cdot\mathbf{x}$ represents fermionic spinization of $|\mathbf{x}|$, $\mathbf{s} = (s_1, s_2, s_3)$ are spin operators for spin 1 particle, $|\mathbf{x}| = \sqrt{\mathbf{x}^2} = \sqrt{-\left(Det(\mathbf{s}\cdot\mathbf{x} + I_3) - Det(I_3)\right)} \to \mathbf{s}\cdot\mathbf{x}$ represents bosonic spinization of $|\mathbf{x}|$, $\mathbf{x}_i$ represents imaginary momentum, $|\mathbf{x}_i| = \sqrt{\mathbf{x}_i^{\,2}} = \sqrt{-Det(\boldsymbol{\sigma}\cdot\mathbf{x}_i)} \to \boldsymbol{\sigma}\cdot\mathbf{x}_i$ represents fermionic spinization of $|\mathbf{x}_i|$, and $|\mathbf{x}_i| = \sqrt{\mathbf{x}_i^{\,2}} = \sqrt{-\left(Det(\mathbf{s}\cdot\mathbf{x}_i + I_3) - Det(I_3)\right)} \to \mathbf{s}\cdot\mathbf{x}_i$ represents bosonic spinization of $|\mathbf{x}_i|$.

(4) A method as in (2) wherein said first representation of said generation, sustenance and evolution of said elementary particle comprises:

$$1 = e^{i0} = 1e^{i0} = Le^{+iM - iM} = \frac{t^2 - \tau^2}{\mathbf{x}^2} e^{+ip^\mu x_\mu - ip^\mu x_\mu} =$$

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

$$\frac{t-\tau}{-|\mathbf{x}|} e^{+ip^\mu x_\mu} - \frac{-|\mathbf{x}|}{t+\tau} e^{+ip^\mu x_\mu} = 0 \to \begin{pmatrix} t-\tau & -|\mathbf{x}| \\ -|\mathbf{x}| & t+\tau \end{pmatrix}\begin{pmatrix} a_{e,+} e^{+ip^\mu x_\mu} \\ a_{i,-} e^{+ip^\mu x_\mu} \end{pmatrix} = 0$$

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

$$\begin{pmatrix} t-\tau & -\mathbf{s}\cdot\mathbf{x} \\ -\mathbf{s}\cdot\mathbf{x} & t+\tau \end{pmatrix}\begin{pmatrix} \mathsf{A}_{e,+}e^{+ip^{\mu}x_{\mu}} \\ \mathsf{A}_{i,-}e^{+ip^{\mu}x_{\mu}} \end{pmatrix} = \begin{pmatrix} L_{M,e} & L_{M,i} \end{pmatrix}\begin{pmatrix} \psi_{e,+} \\ \psi_{i,-} \end{pmatrix} = 0$$

where $\begin{pmatrix} t-\tau & -|\mathbf{x}| \\ -|\mathbf{x}| & t+\tau \end{pmatrix}\begin{pmatrix} a_{e,+}e^{+ip^{\mu}x_{\mu}} \\ a_{i,-}e^{+ip^{\mu}x_{\mu}} \end{pmatrix} = 0$ is a first equation for said unspinized particle in said dual universe, $\begin{pmatrix} t-\tau & -\boldsymbol{\sigma}\cdot\mathbf{x} \\ -\boldsymbol{\sigma}\cdot\mathbf{x} & t+\tau \end{pmatrix}\begin{pmatrix} A_{e,+}e^{+ip^{\mu}x_{\mu}} \\ A_{i,-}e^{+ip^{\mu}x_{\mu}} \end{pmatrix} = 0$ is a first equation in Dirac-like form for said fermion in said dual universe, and $\begin{pmatrix} t-\tau & -\mathbf{s}\cdot\mathbf{x} \\ -\mathbf{s}\cdot\mathbf{x} & t+\tau \end{pmatrix}\begin{pmatrix} \mathsf{A}_{e,+}e^{+ip^{\mu}x_{\mu}} \\ \mathsf{A}_{i,-}e^{+ip^{\mu}x_{\mu}} \end{pmatrix} = 0$ is a first equation for said boson in said dual universe;

$$1 = e^{i0} = 1e^{i0} = L_1 e^{+iM-iM} = \frac{t^2-\mathbf{x}^2}{\tau^2}e^{+ip^{\mu}x_{\mu}-ip^{\mu}x_{\mu}} =$$

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

$$\frac{t-|\mathbf{x}|}{-\tau}e^{+ip^{\mu}x_{\mu}} - \frac{-\tau}{t+|\mathbf{x}|}e^{+ip^{\mu}x_{\mu}} = 0 \to \begin{pmatrix} t-|\mathbf{x}| & -\tau \\ -\tau & t+|\mathbf{x}| \end{pmatrix}\begin{pmatrix} a_{e,l}e^{+ip^{\mu}x_{\mu}} \\ a_{i,r}e^{+ip^{\mu}x_{\mu}} \end{pmatrix} = 0$$

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

$$\begin{pmatrix} t-\mathbf{s}\cdot\mathbf{x} & -\tau \\ -\tau & t+\mathbf{s}\cdot\mathbf{x} \end{pmatrix}\begin{pmatrix} \mathsf{A}_{e,l}e^{+ip^{\mu}x_{\mu}} \\ \mathsf{A}_{i,r}e^{+ip^{\mu}x_{\mu}} \end{pmatrix} = \begin{pmatrix} L_{M,e} & L_{M,i} \end{pmatrix}\begin{pmatrix} \psi_{e,l} \\ \psi_{i,r} \end{pmatrix} = 0$$

where $\begin{pmatrix} t-|\mathbf{x}| & -\tau \\ -\tau & t+|\mathbf{x}| \end{pmatrix}\begin{pmatrix} a_{e,l}e^{+ip^{\mu}x_{\mu}} \\ a_{i,r}e^{+ip^{\mu}x_{\mu}} \end{pmatrix} = 0$ is a second equation for said unspinized particle in said dual universe, $\begin{pmatrix} t-\boldsymbol{\sigma}\cdot\mathbf{x} & -\tau \\ -\tau & t+\boldsymbol{\sigma}\cdot\mathbf{x} \end{pmatrix}\begin{pmatrix} A_{e,l}e^{+ip^{\mu}x_{\mu}} \\ A_{i,r}e^{+ip^{\mu}x_{\mu}} \end{pmatrix} = 0$ is a second equation in Weyl-like form for said fermion in said dual universe, and

$\begin{pmatrix} t-\mathbf{s}\cdot\mathbf{x} & -\tau \\ -\tau & t+\mathbf{s}\cdot\mathbf{x} \end{pmatrix}\begin{pmatrix} \mathbf{A}_{e,l}e^{+ip^{\mu}x_{\mu}} \\ \mathbf{A}_{i,r}e^{+ip^{\mu}x_{\mu}} \end{pmatrix}=0$ is a second equation for said boson in said dual universe;

$$1=e^{i0}=1e^{i0}=Le^{+iM-iM}=\frac{t^2}{\tau^2+\mathbf{x}^2}e^{+ip^{\mu}x_{\mu}-ip^{\mu}x_{\mu}}=$$

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

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

$$\to\begin{pmatrix} t & -\tau-i|\mathbf{x}| \\ -\tau+i|\mathbf{x}| & t \end{pmatrix}\begin{pmatrix} a_e e^{+ip^{\mu}x_{\mu}} \\ a_i e^{+ip^{\mu}x_{\mu}} \end{pmatrix}=0$$

$$\to\begin{pmatrix} t & -\tau-i\boldsymbol{\sigma}\cdot\mathbf{x} \\ -\tau+i\boldsymbol{\sigma}\cdot\mathbf{x} & t \end{pmatrix}\begin{pmatrix} A_e e^{+ip^{\mu}x_{\mu}} \\ A_i e^{+ip^{\mu}x_{\mu}} \end{pmatrix}=\begin{pmatrix} L_{M,e} & L_{M,i} \end{pmatrix}\begin{pmatrix} \psi_e \\ \psi_i \end{pmatrix}=0 \text{ or}$$

$$\begin{pmatrix} t & -\tau-i\mathbf{s}\cdot\mathbf{x} \\ -\tau+i\mathbf{s}\cdot\mathbf{x} & t \end{pmatrix}\begin{pmatrix} \mathbf{A}_e e^{+ip^{\mu}x_{\mu}} \\ \mathbf{A}_i e^{+ip^{\mu}x_{\mu}} \end{pmatrix}=\begin{pmatrix} L_{M,e} & L_{M,i} \end{pmatrix}\begin{pmatrix} \psi_e \\ \psi_i \end{pmatrix}=0$$

where $\begin{pmatrix} t & -\tau-i|\mathbf{x}| \\ -\tau+i|\mathbf{x}| & t \end{pmatrix}\begin{pmatrix} a_e e^{+ip^{\mu}x_{\mu}} \\ a_i e^{+ip^{\mu}x_{\mu}} \end{pmatrix}=0$ is a third equation for said unspinized particle in said dual universe, $\begin{pmatrix} t & -\tau-i\boldsymbol{\sigma}\cdot\mathbf{x} \\ -\tau+i\boldsymbol{\sigma}\cdot\mathbf{x} & t \end{pmatrix}\begin{pmatrix} A_e e^{+ip^{\mu}x_{\mu}} \\ A_i e^{+ip^{\mu}x_{\mu}} \end{pmatrix}=0$ is a third equation in a third form for said fermion in said dual universe, and $\begin{pmatrix} t & -\tau-i\mathbf{s}\cdot\mathbf{x} \\ -\tau+i\mathbf{s}\cdot\mathbf{x} & t \end{pmatrix}\begin{pmatrix} \mathbf{A}_e e^{+ip^{\mu}x_{\mu}} \\ \mathbf{A}_i e^{+ip^{\mu}x_{\mu}} \end{pmatrix}=0$ is a third equation for said boson in said dual universe; or

$$1=e^{i0}=1e^{i0}=Le^{+iM-iM}=\frac{t^2-\tau^2}{\mathbf{x}_i^{\,2}}e^{+ip^{\mu}x_{\mu}-ip^{\mu}x_{\mu}}=$$

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

$$\frac{t-\tau}{-\mathbf{x}_i}e^{+ip^{\mu}x_{\mu}}-\frac{-|\mathbf{x}_i|}{t+\tau}e^{+ip^{\mu}x_{\mu}}=0\to\begin{pmatrix}t-\tau & -|\mathbf{x}_i|\\ -|\mathbf{x}_i| & t+\tau\end{pmatrix}\begin{pmatrix}s_{e,+}e^{+iEt}\\ s_{i,-}e^{+iEt}\end{pmatrix}=0$$

$$\to\begin{pmatrix}t-\tau & -\boldsymbol{\sigma}\cdot\mathbf{x}_i\\ -\boldsymbol{\sigma}\cdot\mathbf{x}_i & t+\tau\end{pmatrix}\begin{pmatrix}S_{e,+}e^{+iEt}\\ S_{i,-}e^{+iEt}\end{pmatrix}=\begin{pmatrix}L_{M,e} & L_{M,i}\end{pmatrix}\begin{pmatrix}\psi_{e,+}\\ \psi_{i,-}\end{pmatrix}=0 \quad \text{or}$$

$$\begin{pmatrix}t-\tau & -\mathbf{s}\cdot\mathbf{x}_i\\ -\mathbf{s}\cdot\mathbf{x}_i & t+\tau\end{pmatrix}\begin{pmatrix}\mathbf{S}_{e,+}e^{+iEt}\\ \mathbf{S}_{i,-}e^{+iEt}\end{pmatrix}=\begin{pmatrix}L_{M,e} & L_{M,i}\end{pmatrix}\begin{pmatrix}\psi_{e,+}\\ \psi_{i,-}\end{pmatrix}=0$$

where $\begin{pmatrix}t-\tau & -|\mathbf{x}_i|\\ -|\mathbf{x}_i| & t+\tau\end{pmatrix}\begin{pmatrix}s_{e,+}e^{+iEt}\\ s_{i,-}e^{+iEt}\end{pmatrix}=0$ is a first equation for said unspinized particle in said dual universe with said imaginary position $\mathbf{x}_i$, $\begin{pmatrix}t-\tau & -\boldsymbol{\sigma}\cdot\mathbf{x}_i\\ -\boldsymbol{\sigma}\cdot\mathbf{x}_i & t+\tau\end{pmatrix}\begin{pmatrix}S_{e,+}e^{+iEt}\\ S_{i,-}e^{+iEt}\end{pmatrix}=0$ is a first equation in Dirac-like form for said fermion in said dual universe with said imaginary position $\mathbf{x}_i$, and $\begin{pmatrix}t-\tau & -\mathbf{s}\cdot\mathbf{x}_i\\ -\mathbf{s}\cdot\mathbf{x}_i & t+\tau\end{pmatrix}\begin{pmatrix}\mathbf{S}_{e,+}e^{+iEt}\\ \mathbf{S}_{i,-}e^{+iEt}\end{pmatrix}=0$ is a first equation for said boson in said dual universe with said imaginary position $\mathbf{x}_i$.

(5) A method as in (4) wherein said elementary particle in said dual energy-momentum universe comprises of:

an electron, equation of said electron being modeled as:

$$\begin{pmatrix}t-\tau & -\boldsymbol{\sigma}\cdot\mathbf{x}\\ -\boldsymbol{\sigma}\cdot\mathbf{x} & t+\tau\end{pmatrix}\begin{pmatrix}A_{e,+}e^{+ip^{\mu}x_{\mu}}\\ A_{i,-}e^{+ip^{\mu}x_{\mu}}\end{pmatrix}=0,\ \begin{pmatrix}t-\boldsymbol{\sigma}\cdot\mathbf{x} & -\tau\\ -\tau & t+\boldsymbol{\sigma}\cdot\mathbf{x}\end{pmatrix}\begin{pmatrix}A_{e,l}e^{+ip^{\mu}x_{\mu}}\\ A_{i,r}e^{+ip^{\mu}x_{\mu}}\end{pmatrix}=0 \quad \text{or}$$

$$\begin{pmatrix}t & -\tau-i\boldsymbol{\sigma}\cdot\mathbf{x}\\ -\tau+i\boldsymbol{\sigma}\cdot\mathbf{x} & t\end{pmatrix}\begin{pmatrix}A_e e^{+ip^{\mu}x_{\mu}}\\ A_i e^{+ip^{\mu}x_{\mu}}\end{pmatrix}=0;$$

a positron, equation of said positron being modeled as:

$$\begin{pmatrix}t-\tau & -\boldsymbol{\sigma}\cdot\mathbf{x}\\ -\boldsymbol{\sigma}\cdot\mathbf{x} & t+\tau\end{pmatrix}\begin{pmatrix}A_{e,-}e^{-ip^{\mu}x_{\mu}}\\ A_{i,+}e^{-ip^{\mu}x_{\mu}}\end{pmatrix}=0,\ \begin{pmatrix}t-\boldsymbol{\sigma}\cdot\mathbf{x} & -\tau\\ -\tau & t+\boldsymbol{\sigma}\cdot\mathbf{s}\end{pmatrix}\begin{pmatrix}A_{e,r}e^{-ip^{\mu}x_{\mu}}\\ A_{i,l}e^{-ip^{\mu}x_{\mu}}\end{pmatrix}=0 \quad \text{or}$$

$$\begin{pmatrix}t & -\tau-i\boldsymbol{\sigma}\cdot\mathbf{x}\\ -\tau+i\boldsymbol{\sigma}\cdot\mathbf{x} & t\end{pmatrix}\begin{pmatrix}A_e e^{-ip^{\mu}x_{\mu}}\\ A_i e^{-ip^{\mu}x_{\mu}}\end{pmatrix}=0;$$

a massless neutrino, equation of said neutrino being modeled as:

$$\begin{pmatrix} t & -\boldsymbol{\sigma}\cdot\mathbf{x} \\ -\boldsymbol{\sigma}\cdot\mathbf{x} & t \end{pmatrix}\begin{pmatrix} A_{e,+}e^{+ip^{\mu}x_{\mu}} \\ A_{i,-}e^{+ip^{\mu}x_{\mu}} \end{pmatrix}=0\,,\ \begin{pmatrix} t-\boldsymbol{\sigma}\cdot\mathbf{x} & \\ & t+\boldsymbol{\sigma}\cdot\mathbf{x} \end{pmatrix}\begin{pmatrix} A_{e,l}e^{+ip^{\mu}x_{\mu}} \\ A_{i,r}e^{+ip^{\mu}x_{\mu}} \end{pmatrix}=0 \text{ or}$$

$$\begin{pmatrix} t & -i\boldsymbol{\sigma}\cdot\mathbf{x} \\ +i\boldsymbol{\sigma}\cdot\mathbf{x} & t \end{pmatrix}\begin{pmatrix} A_{e}e^{+ip^{\mu}x_{\mu}} \\ A_{i}e^{+ip^{\mu}x_{\mu}} \end{pmatrix}=0\,;$$

A massless antineutrino, equation of said antineutrino being modeled as:

$$\begin{pmatrix} t & -\boldsymbol{\sigma}\cdot\mathbf{x} \\ -\boldsymbol{\sigma}\cdot\mathbf{x} & t \end{pmatrix}\begin{pmatrix} A_{e,-}e^{-ip^{\mu}x_{\mu}} \\ A_{i,+}e^{-ip^{\mu}x_{\mu}} \end{pmatrix}=0\,,\ \begin{pmatrix} t-\boldsymbol{\sigma}\cdot\mathbf{x} & \\ & t+\boldsymbol{\sigma}\cdot\mathbf{x} \end{pmatrix}\begin{pmatrix} A_{e,r}e^{-ip^{\mu}x_{\mu}} \\ A_{i,l}e^{-ip^{\mu}x_{\mu}} \end{pmatrix}=0 \text{ or}$$

$$\begin{pmatrix} t & -i\boldsymbol{\sigma}\cdot\mathbf{x} \\ +i\boldsymbol{\sigma}\cdot\mathbf{x} & t \end{pmatrix}\begin{pmatrix} A_{e}e^{-ip^{\mu}x_{\mu}} \\ A_{i}e^{-ip^{\mu}x_{\mu}} \end{pmatrix}=0\,;$$

a massive spin 1 boson, equation of said massive spin 1 boson being modeled as:

$$\begin{pmatrix} t-\tau & -\mathbf{s}\cdot\mathbf{x} \\ -\mathbf{s}\cdot\mathbf{x} & t+\tau \end{pmatrix}\begin{pmatrix} \mathbf{A}_{e,+}e^{+ip^{\mu}x_{\mu}} \\ \mathbf{A}_{i,-}e^{+ip^{\mu}x_{\mu}} \end{pmatrix}=0\,,\ \begin{pmatrix} t-\mathbf{s}\cdot\mathbf{x} & -\tau \\ -\tau & t+\mathbf{s}\cdot\mathbf{x} \end{pmatrix}\begin{pmatrix} \mathbf{A}_{e,l}e^{+ip^{\mu}x_{\mu}} \\ \mathbf{A}_{i,r}e^{+ip^{\mu}x_{\mu}} \end{pmatrix}=0 \text{ or}$$

$$\begin{pmatrix} t & -\tau-i\mathbf{s}\cdot\mathbf{x} \\ -\tau+i\mathbf{s}\cdot\mathbf{x} & t \end{pmatrix}\begin{pmatrix} \mathbf{A}_{e}e^{+ip^{\mu}x_{\mu}} \\ \mathbf{A}_{i}e^{+ip^{\mu}x_{\mu}} \end{pmatrix}=0\,;$$

a massive spin 1 antiboson, equation of said massive spin 1 antiboson being modeled as:

$$\begin{pmatrix} t-\tau & -\mathbf{s}\cdot\mathbf{x} \\ -\mathbf{s}\cdot\mathbf{x} & t+\tau \end{pmatrix}\begin{pmatrix} \mathbf{A}_{e,-}e^{-ip^{\mu}x_{\mu}} \\ \mathbf{A}_{i,+}e^{-ip^{\mu}x_{\mu}} \end{pmatrix}=0\,,\ \begin{pmatrix} t-\mathbf{s}\cdot\mathbf{x} & -\tau \\ -\tau & t+\mathbf{s}\cdot\mathbf{x} \end{pmatrix}\begin{pmatrix} \mathbf{A}_{e,r}e^{-ip^{\mu}x_{\mu}} \\ \mathbf{A}_{i,l}e^{-ip^{\mu}x_{\mu}} \end{pmatrix}=0 \text{ or}$$

$$\begin{pmatrix} t & -\tau-i\mathbf{s}\cdot\mathbf{x} \\ -\tau+i\mathbf{s}\cdot\mathbf{x} & t \end{pmatrix}\begin{pmatrix} \mathbf{A}_{e}e^{-ip^{\mu}x_{\mu}} \\ \mathbf{A}_{i}e^{-ip^{\mu}x_{\mu}} \end{pmatrix}=0\,;$$

a massless spin 1 boson, equation of said massless spin 1 boson being modeled as:

$$\begin{pmatrix} t & -\mathbf{s}\cdot\mathbf{x} \\ -\mathbf{s}\cdot\mathbf{x} & t \end{pmatrix}\begin{pmatrix} \mathsf{A}_{e,+}e^{+ip^{\mu}x_{\mu}} \\ \mathsf{A}_{i,-}e^{+ip^{\mu}x_{\mu}} \end{pmatrix} = \begin{pmatrix} t & -\mathbf{s}\cdot\mathbf{x} \\ -\mathbf{s}\cdot\mathbf{x} & t \end{pmatrix}\begin{pmatrix} \mathbf{E}_{(\mathsf{p},E)} \\ i\mathbf{B}_{(\mathsf{p},E)} \end{pmatrix} = 0,$$

$$\begin{pmatrix} t-\mathbf{s}\cdot\mathbf{x} & \\ & t+\mathbf{s}\cdot\mathbf{x} \end{pmatrix}\begin{pmatrix} \mathsf{A}_{e,l}e^{+ip^{\mu}x_{\mu}} \\ \mathsf{A}_{i,r}e^{+ip^{\mu}x_{\mu}} \end{pmatrix} = 0 \text{ or } \begin{pmatrix} t & -i\mathbf{s}\cdot\mathbf{x} \\ +i\mathbf{s}\cdot\mathbf{x} & t \end{pmatrix}\begin{pmatrix} \mathsf{A}_{e}e^{+ip^{\mu}x_{\mu}} \\ \mathsf{A}_{i}e^{+ip^{\mu}x_{\mu}} \end{pmatrix} = 0$$

where $\begin{pmatrix} t & -\mathbf{s}\cdot\mathbf{x} \\ -\mathbf{s}\cdot\mathbf{x} & t \end{pmatrix}\begin{pmatrix} \mathbf{E}_{(\mathsf{p},E)} \\ i\mathbf{B}_{(\mathsf{p},E)} \end{pmatrix} = 0$ is equivalent to Maxwell-type equations $\begin{pmatrix} \partial_E \mathbf{E}_{(\mathsf{p},E)} = \nabla_p \times \mathbf{B}_{(\mathsf{p},E)} \\ \partial_E \mathbf{B}_{(\mathsf{p},E)} = -\nabla_p \times \mathbf{E}_{(\mathsf{p},E)} \end{pmatrix}$ in said dual energy-momentum universe;

a massless spin 1 antiboson, equation of said massless spin 1 antiboson being modeled as:

$$\begin{pmatrix} t & -\mathbf{s}\cdot\mathbf{x} \\ -\mathbf{s}\cdot\mathbf{x} & t \end{pmatrix}\begin{pmatrix} \mathsf{A}_{e,-}e^{-ip^{\mu}x_{\mu}} \\ \mathsf{A}_{i,+}e^{-ip^{\mu}x_{\mu}} \end{pmatrix} = 0, \quad \begin{pmatrix} t-\mathbf{s}\cdot\mathbf{x} & \\ & t+\mathbf{s}\cdot\mathbf{x} \end{pmatrix}\begin{pmatrix} \mathsf{A}_{e,r}e^{-ip^{\mu}x_{\mu}} \\ \mathsf{A}_{i,l}e^{-ip^{\mu}x_{\mu}} \end{pmatrix} = 0 \text{ or}$$

$$\begin{pmatrix} t & -i\mathbf{s}\cdot\mathbf{x} \\ -s+i\mathbf{s}\cdot\mathbf{x} & t \end{pmatrix}\begin{pmatrix} \mathsf{A}_{e}e^{-ip^{\mu}x_{\mu}} \\ \mathsf{A}_{i}e^{-ip^{\mu}x_{\mu}} \end{pmatrix} = 0;$$

an antiproton, equation of said antiproton being modeled as:

$$\begin{pmatrix} t-s & -\boldsymbol{\sigma}\cdot\mathbf{x}_i \\ -\boldsymbol{\sigma}\cdot\mathbf{x}_i & t+s \end{pmatrix}\begin{pmatrix} S_{e,+}e^{+iEt} \\ S_{i,-}e^{+iEt} \end{pmatrix} = 0, \quad \begin{pmatrix} t-\boldsymbol{\sigma}\cdot\mathbf{x}_i & -s \\ -s & t+\boldsymbol{\sigma}\cdot\mathbf{x}_i \end{pmatrix}\begin{pmatrix} S_{e,l}e^{+iEt} \\ S_{i,r}e^{+iEt} \end{pmatrix} = 0 \text{ or}$$

$$\begin{pmatrix} t & -s-i\boldsymbol{\sigma}\cdot\mathbf{x}_i \\ -s+i\boldsymbol{\sigma}\cdot\mathbf{x}_i & t \end{pmatrix}\begin{pmatrix} S_{e}e^{+iEt} \\ S_{i}e^{+iEt} \end{pmatrix} = 0; \text{ or}$$

a proton, equation of said proton being modeled as:

$$\begin{pmatrix} t-s & -\boldsymbol{\sigma}\cdot\mathbf{x}_i \\ -\boldsymbol{\sigma}\cdot\mathbf{x}_i & t+s \end{pmatrix}\begin{pmatrix} S_{e,-}e^{-iEt} \\ S_{i,+}e^{-iEt} \end{pmatrix} = 0, \quad \begin{pmatrix} t-\boldsymbol{\sigma}\cdot\mathbf{x}_i & -s \\ -s & t+\boldsymbol{\sigma}\cdot\mathbf{x}_i \end{pmatrix}\begin{pmatrix} S_{e,r}e^{-iEt} \\ S_{i,l}e^{-iEt} \end{pmatrix} = 0 \text{ or}$$

$$\begin{pmatrix} t & -s-i\boldsymbol{\sigma}\cdot\mathbf{x}_i \\ -s+i\boldsymbol{\sigma}\cdot\mathbf{x}_i & t \end{pmatrix}\begin{pmatrix} S_{e}e^{-iEt} \\ S_{i}e^{-iEt} \end{pmatrix} = 0.$$

(6) A method as in (4) wherein said elementary particle comprises an electron in said dual energy-momentum universe and said first representation is modified to include a proton, said proton being modeled as a second elementary particle in said dual energy-momentum universe,

and interaction fields of said electron and said proton, said modified first representation comprising:

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

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

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

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

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

where $(\boldsymbol{A}_{(\boldsymbol{p},E)},\phi_{(\boldsymbol{p},E)})$ & e are respectively four-potential & charge in said dual energy-momentum universe, $(\ )_e$ denotes electron, $(\ )_p$ denotes proton and $((\ )_e(\ )_p)$ denotes an electron-proton system.

(7) A method as in (4) wherein said elementary particle comprises of an electron in said dual energy-momentum universe and said first representation is modified to include an unspinized proton, said unspinized proton being modeled as a second elementary particle in said dual energy-momentum universe, and interaction fields of said electron and said unspinized proton, said modified first representation comprising:

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

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

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

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

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

where $(\boldsymbol{A}_{(\boldsymbol{p},E)},\phi_{(\boldsymbol{p},E)})$ & e are respectively four-potential & charge in said dual energy-momentum universe, $(\ )_e$ denotes electron, $(\ )_p$ denotes unspinized proton and $((\ )_e(\ )_p)$ denotes an electron-unspinized proton system.

(8) A method as in (1), (2), (3), (4) or (5) wherein said external object interacting with said internal object through said matrix rule is modeled as self-gravity or self-quantum-entanglement in said dual energy-momentum universe.

(9) A method as in (3) or (4) wherein fermionic spinization $|\mathbf{x}|=\sqrt{\mathbf{x}^2}=\sqrt{-Det(\boldsymbol{\sigma}\cdot\mathbf{x})}\rightarrow\boldsymbol{\sigma}\cdot\mathbf{x}$ and/or reversal of said fermionic spinization $\boldsymbol{\sigma}\cdot\mathbf{x}\rightarrow\sqrt{-Det(\boldsymbol{\sigma}\cdot\mathbf{x})}=\sqrt{\mathbf{x}^2}=|\mathbf{x}|$ is modeled as a first form of weak interaction in said dual energy-momentum universe; bosonic spinization $|\mathbf{x}|=\sqrt{\mathbf{x}^2}=\sqrt{-\left(Det(\mathbf{s}\cdot\mathbf{x}+I_3)-Det(I_3)\right)}\rightarrow\mathbf{s}\cdot\mathbf{x}$ of said elementary particle with rest mass and/or decay of said massive boson is modeled as a second form of weak interaction in said dual energy-momentum universe; and said bosonic spinization of said elementary particle with no rest mass and/or reversal of said bosonic spinization $\mathbf{s}\cdot\mathbf{x}\rightarrow\sqrt{-\left(Det(\mathbf{s}\cdot\mathbf{x}+I_3)-Det(I_3)\right)}=\sqrt{\mathbf{x}^2}=|\mathbf{x}|$ of said massless boson is modeled as a form of electromagnetic interaction in said dual energy-momentum universe.

(10) A method as in (3) or (4) wherein a form of interaction or process involving imaginary position $\boldsymbol{x}_i$ is modeled as strong interaction in said dual energy-momentum universe.

(11) A method as in (1), (2), (3), (4) or (5) wherein said first representation is modified to include a second elementary particle comprising a second external object and a second internal object; and interaction between said external object and said second internal object and/or between said second external object and said internal object is modeled as gravity or quantum entanglement in said dual energy-momentum universe.

(12) A method of modeling an interaction inside brain through hierarchical self-referential spin in premomentumenergy, as a teaching and/or modeling tool, comprising the steps of:

generating a first representation of said interaction through said hierarchical self-referential spin in said premomentumenergy, said representation comprising:

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

$$\begin{pmatrix} t & -\boldsymbol{\sigma}\cdot\mathbf{x} \\ -\boldsymbol{\sigma}\cdot\mathbf{x} & t \end{pmatrix}\begin{pmatrix}\boldsymbol{\sigma}\cdot\mathbf{E}_{(\mathbf{p},E)}\\ i\boldsymbol{\sigma}\cdot\mathbf{B}_{(\mathbf{p},E)}\end{pmatrix}=\begin{pmatrix} i\boldsymbol{\sigma}\cdot(\psi^{\dagger}\beta\boldsymbol{\alpha}\psi)+i\boldsymbol{\sigma}\cdot\mathbf{j}_{(\mathbf{p},E)} \\ i(\psi^{\dagger}\beta\beta\psi)+i\rho_{(\mathbf{p},E)}\end{pmatrix}_p$$, and/or

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

$$\begin{pmatrix} t & -\boldsymbol{\sigma}\cdot\mathbf{x} \\ -\boldsymbol{\sigma}\cdot\mathbf{x} & t \end{pmatrix}\begin{pmatrix}\boldsymbol{\sigma}\cdot\mathbf{E}_{(\mathbf{p},E)}\\ i\boldsymbol{\sigma}\cdot\mathbf{B}_{(\mathbf{p},E)}\end{pmatrix}=\begin{pmatrix} i\boldsymbol{\sigma}\cdot(\psi^{\dagger}\beta\boldsymbol{\alpha}\psi)+i\boldsymbol{\sigma}\cdot\mathbf{j}_{(\mathbf{p},E)} \\ i(\psi^{\dagger}\beta\beta\psi)+i\rho_{(\mathbf{p},E)}\end{pmatrix}_e$$,

where $(\ )_p$ $(\ )_p$ denotes a proton-photon system, $(\ )_e$ $(\ )_e$ denotes an electron - photon system, $(\boldsymbol{A},\phi)$ denotes electromagnetic potential, $\boldsymbol{E}$ denotes electric field, $\boldsymbol{B}$ denotes magnetic field, $\boldsymbol{\sigma} = (\sigma_1, \sigma_2, \sigma_3)$ denote Pauli matrices, $(\boldsymbol{\alpha}, \beta)$ denote Dirac matrices, Ψ denotes wave function, and $\Psi^{\dagger}$ denotes conjugate transpose of Ψ; and

presenting and/or modeling said first representation in a device for teaching and/or research.

2. Modeling Method Based on Premomentumenergy Model II

(1) A method for presenting and/or modeling generation of a time-position-propertime relation of an elementary particle through hierarchical self-referential spin in premomentumenergy, as a research aide, teaching tool and/or game, comprising the steps of:

generating a first representation of said spin producing said time-position-propertime relation of said elementary particle through said hierarchical self-referential spin in said premomentumenergy, said first representation comprising:

$$1=e^{i0}=e^{+iL-iL}=(\cos L+i\sin L)(\cos L-i\sin L)=$$

$$\left(\frac{\tau}{t}+i\frac{|\mathbf{x}|}{t}\right)\left(\frac{\tau}{t}-i\frac{|\mathbf{x}|}{t}\right)=\left(\frac{\tau^2+\mathbf{x}^2}{t^2}\right)\rightarrow t^2=\mathbf{x}^2+\tau^2$$

where e is natural exponential base, i is imaginary unit, L is a phase, t, $\boldsymbol{x}$ and τ represent respectively time, position and intrinsic proper time of said elementary particle, and speed of light c is set equal to one; and

presenting and/or modeling said first representation in a device for research, teaching and/or game.

(2) A method as in (1) wherein said first representation is modified to include a four-potential ($\boldsymbol{A}_{(\boldsymbol{p},E)},\phi_{(\boldsymbol{p},E)}$) generated by a second elementary particle, said modified representation comprising:

$$1=e^{i0}=e^{+iL-iL}=(\cos L+i\sin L)(\cos L-i\sin L)=$$

$$\left(\frac{\tau}{t-e\phi_{(\mathbf{p},E)}}+i\frac{\left|\mathbf{x}\text{ - e}\mathbf{A}_{(\mathbf{p},E)}\right|}{\tau-e\phi_{(\mathbf{p},E)}}\right)\left(\frac{\tau}{t-e\phi_{(\mathbf{p},E)}}-i\frac{\left|\mathbf{x}\text{ - e}\mathbf{A}_{(\mathbf{p},E)}\right|}{t-e\phi_{(\mathbf{p},E)}}\right)=$$

$$\left(\frac{\tau^2+\left|\mathbf{x}\text{ - e}\mathbf{A}_{(\mathbf{p},E)}\right|^2}{\left(t-e\phi_{(\mathbf{p},E)}\right)^2}\right)\rightarrow\left(t-e\phi_{(\mathbf{p},E)}\right)^2=\left(\mathbf{x}\text{ - e}\mathbf{A}_{(\mathbf{p},E)}\right)^2+\tau^2$$

where e next to $\boldsymbol{A}_{(\boldsymbol{p},E)}$ *or* $\phi_{(\boldsymbol{p},E)}$) is a charge of said elementary particle.

(3) A method as in (1) for presenting and/or modeling generation of a self-referential matrix rule further comprising the steps of:

generating a second representation of said spin forming said matrix rule from said time-position-propertime relation, said second representation comprising:

$$\rightarrow 1=\frac{t^2-\tau^2}{\mathbf{x}^2}=\left(\frac{t-\tau}{-|\mathbf{x}|}\right)\left(\frac{-\mathbf{x}}{t+\tau}\right)^{-1}\rightarrow\frac{t-\tau}{-|\mathbf{x}|}=\frac{-|\mathbf{x}|}{t+\tau}\rightarrow\frac{t-\tau}{-|\mathbf{x}|}-\frac{-|\mathbf{x}|}{t+\tau}=0$$

$$\rightarrow\begin{pmatrix}t-\tau & -|\mathbf{x}|\\ -|\mathbf{x}| & t+\tau\end{pmatrix}\rightarrow\begin{pmatrix}t-\tau & -\boldsymbol{\sigma}\cdot\mathbf{x}\\ -\boldsymbol{\sigma}\cdot\mathbf{x} & t+\tau\end{pmatrix}\text{ or }\begin{pmatrix}t-\tau & -\mathbf{s}\cdot\mathbf{x}\\ -\mathbf{s}\cdot\mathbf{x} & t+\tau\end{pmatrix},$$

$$\rightarrow 1=\frac{t^2-\mathbf{x}^2}{\tau^2}=\left(\frac{t-|\mathbf{x}|}{-\tau}\right)\left(\frac{-\tau}{t+|\mathbf{x}|}\right)^{-1}\rightarrow\frac{t-|\mathbf{x}|}{-\tau}=\frac{-\tau}{t+|\mathbf{x}|}\rightarrow\frac{t-|\mathbf{x}|}{-\tau}-\frac{-\tau}{t+|\mathbf{x}|}=0$$

$$\rightarrow\begin{pmatrix}t-|\mathbf{x}| & -\tau\\ -\tau & t+|\mathbf{x}|\end{pmatrix}\rightarrow\begin{pmatrix}t-\boldsymbol{\sigma}\cdot\mathbf{x} & -\tau\\ -\tau & t+\boldsymbol{\sigma}\cdot\mathbf{x}\end{pmatrix}\text{ or }\begin{pmatrix}t-\mathbf{s}\cdot\mathbf{x} & -\tau\\ -\tau & t+\mathbf{s}\cdot\mathbf{x}\end{pmatrix},$$

$$\to 1 = \frac{\tau^2 + \mathbf{x}^2}{t^2} = \left(\frac{t}{-\tau + i|\mathbf{x}|}\right)^{-1}\left(\frac{-\tau - i|\mathbf{x}|}{t}\right)$$

$$\to \frac{t}{-\tau + i|\mathbf{x}|} = \frac{-\tau - i|\mathbf{x}|}{t} \to \frac{t}{-\tau + i|\mathbf{x}|} - \frac{-\tau - i|\mathbf{x}|}{t} = 0$$

$$\to \begin{pmatrix} t & -\tau - i|\mathbf{x}| \\ -\tau + i|\mathbf{x}| & t \end{pmatrix} \to \begin{pmatrix} t & -\tau - i\boldsymbol{\sigma}\cdot\mathbf{x} \\ -\tau + i\boldsymbol{\sigma}\cdot\mathbf{x} & t \end{pmatrix} \text{or} \begin{pmatrix} t & -\tau - i\mathbf{s}\cdot\mathbf{x} \\ -\tau + i\mathbf{s}\cdot\mathbf{x} & t \end{pmatrix}, \text{ or}$$

$$\to 1 = \frac{t^2 - \mathbf{x}_i^{\,2}}{\tau^2} = \left(\frac{t - |\mathbf{x}_i|}{-\tau}\right)\left(\frac{-\tau}{t + |\mathbf{x}_i|}\right)^{-1} \to \frac{t - |\mathbf{x}_i|}{-\tau} = \frac{-\tau}{t + |\mathbf{x}_i|} \to \frac{t - |\mathbf{x}_i|}{-\tau} - \frac{-\tau}{t + |\mathbf{x}_i|} = 0$$

$$\to \begin{pmatrix} t - |\mathbf{x}_i| & -\tau \\ -\tau & t + |\mathbf{x}_i| \end{pmatrix} \to \begin{pmatrix} t - \boldsymbol{\sigma}\cdot\mathbf{x}_i & -\tau \\ -\tau & t + \boldsymbol{\sigma}\cdot\mathbf{x}_i \end{pmatrix} \text{ or } \begin{pmatrix} t - \mathbf{s}\cdot\mathbf{x}_i & -\tau \\ -\tau & t + \mathbf{s}\cdot\mathbf{x}_i \end{pmatrix},$$

where $\boldsymbol{\sigma} = (\sigma_1, \sigma_2, \sigma_3)$ are Pauli matrices, $|\mathbf{x}| = \sqrt{\mathbf{x}^2} = \sqrt{-Det(\boldsymbol{\sigma}\cdot\mathbf{x})} \to \boldsymbol{\sigma}\cdot\mathbf{x}$ represents fermionic spinization of $|\mathbf{x}|$, $\mathbf{s} = (s_1, s_2, s_3)$ are spin operators for spin 1 particle, $|\mathbf{x}| = \sqrt{\mathbf{x}^2} = \sqrt{-\left(Det(\mathbf{s}\cdot\mathbf{x} + I_3) - Det(I_3)\right)} \to \mathbf{s}\cdot\mathbf{x}$ represents bosonic spinization of $|\mathbf{x}|$, $\mathbf{x}_i$ represents imaginary momentum, $|\mathbf{x}_i| = \sqrt{\mathbf{x}_i^{\,2}} = \sqrt{-Det(\boldsymbol{\sigma}\cdot\mathbf{x}_i)} \to \boldsymbol{\sigma}\cdot\mathbf{x}_i$ represents fermionic spinization of $|\mathbf{x}_i|$, and $|\mathbf{x}_i| = \sqrt{\mathbf{x}_i^{\,2}} = \sqrt{-\left(Det(\mathbf{s}\cdot\mathbf{x}_i + I_3) - Det(I_3)\right)} \to \mathbf{s}\cdot\mathbf{x}_i$ represents bosonic spinization of $|\mathbf{x}_i|$; presenting and/or modeling said second representation in said device for research, teaching and/or game.

(4) A method for presenting and/or modeling generation, sustenance and evolution of an elementary particle through hierarchical self-referential spin in premomentumenergy, as a research aide, teaching tool and/or game, comprising the steps of:

generating a first representation of said generation, sustenance and evolution of said elementary particle through said hierarchical self-referential spin in said premomentumenergy, said first representation comprising:

$$1 = e^{i0} = e^{i0}e^{i0} = e^{+iL-iL}e^{+iM-iM} = L_e L_i^{-1}\left(e^{+iM}\right)\left(e^{+iM}\right)^{-1} \to$$

$$\begin{pmatrix} L_{M,e} & L_{M,i} \end{pmatrix}\begin{pmatrix} A_e e^{+iM} \\ A_i e^{+iM} \end{pmatrix} = L_M \begin{pmatrix} \psi_e \\ \psi_i \end{pmatrix} = 0$$

where e is natural exponential base, i is imaginary unit, L is a first phase, M is a second phase, $A_e e^{-iM} = \psi_e$ represents external object, $A_i e^{-iM} = \psi_i$ represents internal object, L_e represents external rule, L_i represents internal rule, $L = (L_{M,e}\ L_{M,i})$

represents matrix rule, $L_{M,e}$ represents external matrix rule and $L_{M,i}$ represents internal matrix rule; and

presenting and/or modeling said first representation in a device for research, teaching and/or game.

(5) A method as in (4) wherein said external object comprises of an external wave function in an external energy-momentum space; said internal object comprises of an internal wave function in internal energy-momentum space; said elementary particle comprises of a fermion, boson or unspinized particle in a dual energy-momentum universe comprising said external energy-momentum space and said internal energy-momentum space; said matrix rule contains a time operator $t \to -i\partial_E$, position operator $\mathbf{x} \to i\nabla$, spin operator $\boldsymbol{\sigma}$ where $\boldsymbol{\sigma} = (\sigma_1, \sigma_2, \sigma_3)$ are Pauli matrices, spin operator $\mathbf{S}$ where $\mathbf{S} = (s_1, s_2, s_3)$ are spin 1 matrices, and/or intrinsic proper time associated with said elementary particle; said matrix rule further has a determinant containing t^2-$\boldsymbol{x}^2$-$\tau^2 = 0$, $t^2 - \boldsymbol{x}^2 = 0$, $t^2 - \tau^2 = 0$, or $0^2 - \boldsymbol{x}^2 - \tau^2=0$; $c=1$ where c is speed of light; and $\hbar=1$ where $\hbar$ is reduced Planck constant.

(6) A method as (5) wherein said first representation of said generation, sustenance and evolution of said elementary particle comprises:

$$1 = e^{i0} = e^{i0}e^{i0} = e^{+iL-iL}e^{+iM-iM} = (\cos L + i\sin L)(\cos L - i\sin L)e^{+iM-iM} =$$

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

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

$$\frac{t-\tau}{-|\mathbf{x}|}e^{+ip^\mu x_\mu} - \frac{-|\mathbf{x}|}{t+\tau}e^{+ip^\mu x_\mu} = 0 \to \begin{pmatrix} t-\tau & -|\mathbf{x}| \\ -|\mathbf{x}| & t+\tau \end{pmatrix}\begin{pmatrix} a_{e,+}e^{+ip^\mu x_\mu} \\ a_{i,-}e^{+ip^\mu x_\mu} \end{pmatrix} = 0$$

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

$$\begin{pmatrix} t-\tau & -\mathbf{s}\cdot\mathbf{x} \\ -\mathbf{s}\cdot\mathbf{x} & t+\tau \end{pmatrix}\begin{pmatrix} \mathsf{A}_{e,+}e^{+ip^{\mu}x_{\mu}} \\ \mathsf{A}_{i,-}e^{+ip^{\mu}x_{\mu}} \end{pmatrix} = \begin{pmatrix} L_{M,e} & L_{M,i} \end{pmatrix}\begin{pmatrix} \psi_{e,+} \\ \psi_{i,-} \end{pmatrix} = 0$$

where $\begin{pmatrix} t-\tau & -|\mathbf{x}| \\ -|\mathbf{x}| & t+\tau \end{pmatrix}\begin{pmatrix} a_{e,+}e^{+ip^{\mu}x_{\mu}} \\ a_{i,-}e^{+ip^{\mu}x_{\mu}} \end{pmatrix} = 0$ is a first equation for said unspinized particle in said dual universe, $\begin{pmatrix} t-\tau & -\boldsymbol{\sigma}\cdot\mathbf{x} \\ -\boldsymbol{\sigma}\cdot\mathbf{x} & t+\tau \end{pmatrix}\begin{pmatrix} A_{e,+}e^{+ip^{\mu}x_{\mu}} \\ A_{i,-}e^{+ip^{\mu}x_{\mu}} \end{pmatrix} = 0$ is a first equation in Dirac-like form for said fermion in said dual universe, and $\begin{pmatrix} t-\tau & -\mathbf{s}\cdot\mathbf{x} \\ -\mathbf{s}\cdot\mathbf{x} & t+\tau \end{pmatrix}\begin{pmatrix} \mathsf{A}_{e,+}e^{+ip^{\mu}x_{\mu}} \\ \mathsf{A}_{i,-}e^{+ip^{\mu}x_{\mu}} \end{pmatrix} = 0$ is a first equation for said boson in said dual universe;

$$1 = e^{i0} = e^{i0}e^{i0} = e^{+iL-iL}e^{+iM-iM} = (\cos L + i\sin L)(\cos L - i\sin L)e^{+iM-iM} =$$

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

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

$$\frac{t-|\mathbf{x}|}{-\tau}e^{+ip^{\mu}x_{\mu}} - \frac{-\tau}{t+|\mathbf{x}|}e^{+ip^{\mu}x_{\mu}} = 0 \to \begin{pmatrix} t-|\mathbf{x}| & -\tau \\ -\tau & t+|\mathbf{x}| \end{pmatrix}\begin{pmatrix} a_{e,l}e^{+ip^{\mu}x_{\mu}} \\ a_{i,r}e^{+ip^{\mu}x_{\mu}} \end{pmatrix} = 0$$

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

$$\begin{pmatrix} t-\mathbf{s}\cdot\mathbf{x} & -\tau \\ -\tau & t+\mathbf{s}\cdot\mathbf{x} \end{pmatrix}\begin{pmatrix} \mathsf{A}_{e,l}e^{+ip^{\mu}x_{\mu}} \\ \mathsf{A}_{i,r}e^{+ip^{\mu}x_{\mu}} \end{pmatrix} = \begin{pmatrix} L_{M,e} & L_{M,i} \end{pmatrix}\begin{pmatrix} \psi_{e,l} \\ \psi_{i,r} \end{pmatrix} = 0$$

where $\begin{pmatrix} t-|\mathbf{x}| & -\tau \\ -\tau & t+|\mathbf{x}| \end{pmatrix}\begin{pmatrix} a_{e,l}e^{+ip^{\mu}x_{\mu}} \\ a_{i,r}e^{+ip^{\mu}x_{\mu}} \end{pmatrix} = 0$ is a second equation for said unspinized particle in said dual universe, $\begin{pmatrix} t-\boldsymbol{\sigma}\cdot\mathbf{x} & -\tau \\ -\tau & t+\boldsymbol{\sigma}\cdot\mathbf{x} \end{pmatrix}\begin{pmatrix} A_{e,l}e^{+ip^{\mu}x_{\mu}} \\ A_{i,r}e^{+ip^{\mu}x_{\mu}} \end{pmatrix} = 0$ is a second equation in Weyl-like form for said fermion in said dual universe, and $\begin{pmatrix} t-\mathbf{s}\cdot\mathbf{x} & -\tau \\ -\tau & t+\mathbf{s}\cdot\mathbf{x} \end{pmatrix}\begin{pmatrix} \mathsf{A}_{e,l}e^{+ip^\mu x_\mu} \\ \mathsf{A}_{i,r}e^{+ip^\mu x_\mu} \end{pmatrix}=0$ is a second equation for said boson in said dual universe;

$$1=e^{i0}=e^{i0}e^{i0}=e^{+iL-iL}e^{+iM-iM}=(\cos L+i\sin L)(\cos L-i\sin L)e^{+iM-iM}=$$

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

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

$$\rightarrow\begin{pmatrix} t & -\tau-i|\mathbf{x}| \\ -\tau+i|\mathbf{x}| & t \end{pmatrix}\begin{pmatrix} a_e e^{+ip^\mu x_\mu} \\ a_i e^{+ip^\mu x_\mu} \end{pmatrix}=0$$

$$\rightarrow\begin{pmatrix} t & -\tau-i\boldsymbol{\sigma}\cdot\mathbf{x} \\ -\tau+i\boldsymbol{\sigma}\cdot\mathbf{x} & t \end{pmatrix}\begin{pmatrix} A_e e^{+ip^\mu x_\mu} \\ A_i e^{+ip^\mu x_\mu} \end{pmatrix}=\begin{pmatrix} L_{M,e} & L_{M,i} \end{pmatrix}\begin{pmatrix} \psi_e \\ \psi_i \end{pmatrix}=0 \quad \text{or}$$

$$\begin{pmatrix} t & -\tau-i\mathbf{s}\cdot\mathbf{x} \\ -\tau+i\mathbf{s}\cdot\mathbf{x} & t \end{pmatrix}\begin{pmatrix} \mathsf{A}_e e^{+ip^\mu x_\mu} \\ \mathsf{A}_i e^{+ip^\mu x_\mu} \end{pmatrix}=\begin{pmatrix} L_{M,e} & L_{M,i} \end{pmatrix}\begin{pmatrix} \psi_e \\ \psi_i \end{pmatrix}=0$$

where $\begin{pmatrix} t & -\tau-i|\mathbf{x}| \\ -\tau+i|\mathbf{x}| & t \end{pmatrix}\begin{pmatrix} a_e e^{+ip^\mu x_\mu} \\ a_i e^{+ip^\mu x_\mu} \end{pmatrix}=0$ is a third equation for said unspinized particle in said dual universe, $\begin{pmatrix} t & -\tau-i\boldsymbol{\sigma}\cdot\mathbf{x} \\ -\tau+i\boldsymbol{\sigma}\cdot\mathbf{x} & t \end{pmatrix}\begin{pmatrix} A_e e^{+ip^\mu x_\mu} \\ A_i e^{+ip^\mu x_\mu} \end{pmatrix}=0$ is a third equation in a third form for said fermion in said dual universe, and $\begin{pmatrix} t & -\tau-i\mathbf{s}\cdot\mathbf{x} \\ -\tau+i\mathbf{s}\cdot\mathbf{x} & t \end{pmatrix}\begin{pmatrix} \mathsf{A}_e e^{+ip^\mu x_\mu} \\ \mathsf{A}_i e^{+ip^\mu x_\mu} \end{pmatrix}=0$ is a third equation for said boson in said dual universe; or

$$1=e^{i0}=e^{i0}e^{i0}=e^{+iL-iL}e^{+iM-iM}=(\cos L+i\sin L)(\cos L-i\sin L)e^{+iM-iM}=$$

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

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

$$\frac{t-\tau}{-\mathbf{x}_i}e^{+ip^\mu x_\mu}-\frac{-|\mathbf{x}_i|}{t+\tau}e^{+ip^\mu x_\mu}=0\rightarrow\begin{pmatrix}t-\tau & -|\mathbf{x}_i|\\ -|\mathbf{x}_i| & t+\tau\end{pmatrix}\begin{pmatrix}s_{e,+}e^{+iEt}\\ s_{i,-}e^{+iEt}\end{pmatrix}=0$$

$$\rightarrow\begin{pmatrix}t-\tau & -\boldsymbol{\sigma}\cdot\mathbf{x}_i\\ -\boldsymbol{\sigma}\cdot\mathbf{x}_i & t+\tau\end{pmatrix}\begin{pmatrix}S_{e,+}e^{+iEt}\\ S_{i,-}e^{+iEt}\end{pmatrix}=\begin{pmatrix}L_{M,e} & L_{M,i}\end{pmatrix}\begin{pmatrix}\psi_{e,+}\\ \psi_{i,-}\end{pmatrix}=0 \quad \text{or}$$

$$\begin{pmatrix}t-\tau & -\mathbf{s}\cdot\mathbf{x}_i\\ -\mathbf{s}\cdot\mathbf{x}_i & t+\tau\end{pmatrix}\begin{pmatrix}\mathbf{S}_{e,+}e^{+iEt}\\ \mathbf{S}_{i,-}e^{+iEt}\end{pmatrix}=\begin{pmatrix}L_{M,e} & L_{M,i}\end{pmatrix}\begin{pmatrix}\psi_{e,+}\\ \psi_{i,-}\end{pmatrix}=0$$

where $\begin{pmatrix}t-\tau & -|\mathbf{x}_i|\\ -|\mathbf{x}_i| & t+\tau\end{pmatrix}\begin{pmatrix}s_{e,+}e^{+iEt}\\ s_{i,-}e^{+iEt}\end{pmatrix}=0$ is a first equation for said unspinized particle in said dual universe with said imaginary position $\mathbf{x}_i$, $\begin{pmatrix}t-\tau & -\boldsymbol{\sigma}\cdot\mathbf{x}_i\\ -\boldsymbol{\sigma}\cdot\mathbf{x}_i & t+\tau\end{pmatrix}\begin{pmatrix}S_{e,+}e^{+iEt}\\ S_{i,-}e^{+iEt}\end{pmatrix}=0$ is a first equation in Dirac form for said fermion in said dual universe with said imaginary position $\mathbf{x}_i$, and $\begin{pmatrix}t-\tau & -\mathbf{s}\cdot\mathbf{x}_i\\ -\mathbf{s}\cdot\mathbf{x}_i & t+\tau\end{pmatrix}\begin{pmatrix}\mathbf{S}_{e,+}e^{+iEt}\\ \mathbf{S}_{i,-}e^{+iEt}\end{pmatrix}=0$ is a first equation for said boson in said dual universe with said imaginary position $\mathbf{x}_i$.

(7) A method as in (6) wherein said elementary particle in said dual energy-momentum universe comprises of:

an electron, equation of said electron being modeled as:

$$\begin{pmatrix}t-\tau & -\boldsymbol{\sigma}\cdot\mathbf{x}\\ -\boldsymbol{\sigma}\cdot\mathbf{x} & t+\tau\end{pmatrix}\begin{pmatrix}A_{e,+}e^{+ip^\mu x_\mu}\\ A_{i,-}e^{+ip^\mu x_\mu}\end{pmatrix}=0,\ \begin{pmatrix}t-\boldsymbol{\sigma}\cdot\mathbf{x} & -\tau\\ -\tau & t+\boldsymbol{\sigma}\cdot\mathbf{x}\end{pmatrix}\begin{pmatrix}A_{e,l}e^{+ip^\mu x_\mu}\\ A_{i,r}e^{+ip^\mu x_\mu}\end{pmatrix}=0 \quad \text{or}$$

$$\begin{pmatrix}t & -\tau-i\boldsymbol{\sigma}\cdot\mathbf{x}\\ -\tau+i\boldsymbol{\sigma}\cdot\mathbf{x} & t\end{pmatrix}\begin{pmatrix}A_e e^{+ip^\mu x_\mu}\\ A_i e^{+ip^\mu x_\mu}\end{pmatrix}=0;$$

a positron, equation of said positron being modeled as:

$$\begin{pmatrix}t-\tau & -\boldsymbol{\sigma}\cdot\mathbf{x}\\ -\boldsymbol{\sigma}\cdot\mathbf{x} & t+\tau\end{pmatrix}\begin{pmatrix}A_{e,-}e^{-ip^\mu x_\mu}\\ A_{i,+}e^{-ip^\mu x_\mu}\end{pmatrix}=0,\ \begin{pmatrix}t-\boldsymbol{\sigma}\cdot\mathbf{x} & -\tau\\ -\tau & t+\boldsymbol{\sigma}\cdot\mathbf{s}\end{pmatrix}\begin{pmatrix}A_{e,r}e^{-ip^\mu x_\mu}\\ A_{i,l}e^{-ip^\mu x_\mu}\end{pmatrix}=0 \quad \text{or}$$

$$\begin{pmatrix} t & -\tau - i\boldsymbol{\sigma}\cdot\mathbf{x} \\ -\tau + i\boldsymbol{\sigma}\cdot\mathbf{x} & t \end{pmatrix}\begin{pmatrix} A_e e^{-ip^\mu x_\mu} \\ A_i e^{-ip^\mu x_\mu} \end{pmatrix} = 0\,;$$

a massless neutrino, equation of said neutrino being modeled as:

$$\begin{pmatrix} t & -\boldsymbol{\sigma}\cdot\mathbf{x} \\ -\boldsymbol{\sigma}\cdot\mathbf{x} & t \end{pmatrix}\begin{pmatrix} A_{e,+} e^{+ip^\mu x_\mu} \\ A_{i,-} e^{+ip^\mu x_\mu} \end{pmatrix} = 0\,,\ \begin{pmatrix} t - \boldsymbol{\sigma}\cdot\mathbf{x} & \\ & t + \boldsymbol{\sigma}\cdot\mathbf{x} \end{pmatrix}\begin{pmatrix} A_{e,l} e^{+ip^\mu x_\mu} \\ A_{i,r} e^{+ip^\mu x_\mu} \end{pmatrix} = 0 \text{ or}$$

$$\begin{pmatrix} t & -i\boldsymbol{\sigma}\cdot\mathbf{x} \\ -i\boldsymbol{\sigma}\cdot\mathbf{x} & t \end{pmatrix}\begin{pmatrix} A_e e^{+ip^\mu x_\mu} \\ A_i e^{+ip^\mu x_\mu} \end{pmatrix} = 0\,;$$

A massless antineutrino, equation of said antineutrino being modeled as:

$$\begin{pmatrix} t & -\boldsymbol{\sigma}\cdot\mathbf{x} \\ -\boldsymbol{\sigma}\cdot\mathbf{x} & t \end{pmatrix}\begin{pmatrix} A_{e,-} e^{-ip^\mu x_\mu} \\ A_{i,+} e^{-ip^\mu x_\mu} \end{pmatrix} = 0\,,\ \begin{pmatrix} t - \boldsymbol{\sigma}\cdot\mathbf{x} & \\ & t + \boldsymbol{\sigma}\cdot\mathbf{x} \end{pmatrix}\begin{pmatrix} A_{e,r} e^{-ip^\mu x_\mu} \\ A_{i,l} e^{-ip^\mu x_\mu} \end{pmatrix} = 0 \text{ or}$$

$$\begin{pmatrix} t & -i\boldsymbol{\sigma}\cdot\mathbf{x} \\ -i\boldsymbol{\sigma}\cdot\mathbf{x} & t \end{pmatrix}\begin{pmatrix} A_e e^{-ip^\mu x_\mu} \\ A_i e^{-ip^\mu x_\mu} \end{pmatrix} = 0\,;$$

a massive spin 1 boson, equation of said massive spin 1 boson being modeled as:

$$\begin{pmatrix} t-\tau & -\mathbf{s}\cdot\mathbf{x} \\ -\mathbf{s}\cdot\mathbf{x} & t+\tau \end{pmatrix}\begin{pmatrix} \mathbf{A}_{e,+} e^{+ip^\mu x_\mu} \\ \mathbf{A}_{i,-} e^{+ip^\mu x_\mu} \end{pmatrix} = 0\,,\ \begin{pmatrix} t - \mathbf{s}\cdot\mathbf{x} & -\tau \\ -\tau & t + \mathbf{s}\cdot\mathbf{x} \end{pmatrix}\begin{pmatrix} \mathbf{A}_{e,l} e^{+ip^\mu x_\mu} \\ \mathbf{A}_{i,r} e^{+ip^\mu x_\mu} \end{pmatrix} = 0 \text{ or}$$

$$\begin{pmatrix} t & -\tau - i\mathbf{s}\cdot\mathbf{x} \\ -\tau + i\mathbf{s}\cdot\mathbf{x} & t \end{pmatrix}\begin{pmatrix} \mathbf{A}_e e^{+ip^\mu x_\mu} \\ \mathbf{A}_i e^{+ip^\mu x_\mu} \end{pmatrix} = 0\,;$$

a massive spin 1 antiboson, equation of said massive spin 1 antiboson being modeled as:

$$\begin{pmatrix} t-\tau & -\mathbf{s}\cdot\mathbf{x} \\ -\mathbf{s}\cdot\mathbf{x} & t+\tau \end{pmatrix}\begin{pmatrix} \mathbf{A}_{e,-} e^{-ip^\mu x_\mu} \\ \mathbf{A}_{i,+} e^{-ip^\mu x_\mu} \end{pmatrix} = 0\,,\ \begin{pmatrix} t - \mathbf{s}\cdot\mathbf{x} & -\tau \\ -\tau & t + \mathbf{s}\cdot\mathbf{x} \end{pmatrix}\begin{pmatrix} \mathbf{A}_{e,r} e^{-ip^\mu x_\mu} \\ \mathbf{A}_{i,l} e^{-ip^\mu x_\mu} \end{pmatrix} = 0 \text{ or}$$

$$\begin{pmatrix} t & -\tau - i\mathbf{s}\cdot\mathbf{x} \\ -\tau + i\mathbf{s}\cdot\mathbf{x} & t \end{pmatrix}\begin{pmatrix} \mathbf{A}_e e^{-ip^\mu x_\mu} \\ \mathbf{A}_i e^{-ip^\mu x_\mu} \end{pmatrix} = 0\,;$$

a massless spin 1 boson, equation of said massless spin 1 boson being modeled as:

$$\begin{pmatrix} t & -\mathbf{s}\cdot\mathbf{x} \\ -\mathbf{s}\cdot\mathbf{x} & t \end{pmatrix}\begin{pmatrix} \mathbf{A}_{e,+}e^{+ip^{\mu}x_{\mu}} \\ \mathbf{A}_{i,-}e^{+ip^{\mu}x_{\mu}} \end{pmatrix} = \begin{pmatrix} t & -\mathbf{s}\cdot\mathbf{x} \\ -\mathbf{s}\cdot\mathbf{x} & t \end{pmatrix}\begin{pmatrix} \mathbf{E}_{(\mathbf{p},E)} \\ i\mathbf{B}_{(\mathbf{p},E)} \end{pmatrix} = 0,$$

$$\begin{pmatrix} t-\mathbf{s}\cdot\mathbf{x} & \\ & t+\mathbf{s}\cdot\mathbf{x} \end{pmatrix}\begin{pmatrix} \mathbf{A}_{e,l}e^{+ip^{\mu}x_{\mu}} \\ \mathbf{A}_{i,r}e^{+ip^{\mu}x_{\mu}} \end{pmatrix} = 0 \text{ or } \begin{pmatrix} t & -i\mathbf{s}\cdot\mathbf{x} \\ +i\mathbf{s}\cdot\mathbf{x} & t \end{pmatrix}\begin{pmatrix} \mathbf{A}_{e}e^{+ip^{\mu}x_{\mu}} \\ \mathbf{A}_{i}e^{+ip^{\mu}x_{\mu}} \end{pmatrix} = 0$$

where $\begin{pmatrix} t & -\mathbf{s}\cdot\mathbf{x} \\ -\mathbf{s}\cdot\mathbf{x} & t \end{pmatrix}\begin{pmatrix} \mathbf{E}_{(\mathbf{p},E)} \\ i\mathbf{B}_{(\mathbf{p},E)} \end{pmatrix} = 0$ is equivalent to Maxwell-type equations $\begin{pmatrix} \partial_E \mathbf{E}_{(\mathbf{p},E)} = \nabla_p \times \mathbf{B}_{(\mathbf{p},E)} \\ \partial_E \mathbf{B}_{(\mathbf{p},E)} = -\nabla_p \times \mathbf{E}_{(\mathbf{p},E)} \end{pmatrix}$ in said dual energy-momentum universe;

a massless spin 1 antiboson, equation of said massless spin 1 antiboson being modeled as:

$$\begin{pmatrix} t & -\mathbf{s}\cdot\mathbf{x} \\ -\mathbf{s}\cdot\mathbf{x} & t \end{pmatrix}\begin{pmatrix} \mathbf{A}_{e,-}e^{-ip^{\mu}x_{\mu}} \\ \mathbf{A}_{i,+}e^{-ip^{\mu}x_{\mu}} \end{pmatrix} = 0, \quad \begin{pmatrix} t-\mathbf{s}\cdot\mathbf{x} & \\ & t+\mathbf{s}\cdot\mathbf{x} \end{pmatrix}\begin{pmatrix} \mathbf{A}_{e,r}e^{-ip^{\mu}x_{\mu}} \\ \mathbf{A}_{i,l}e^{-ip^{\mu}x_{\mu}} \end{pmatrix} = 0 \text{ or}$$

$$\begin{pmatrix} t & -i\mathbf{s}\cdot\mathbf{x} \\ -s+i\mathbf{s}\cdot\mathbf{x} & t \end{pmatrix}\begin{pmatrix} \mathbf{A}_{e}e^{-ip^{\mu}x_{\mu}} \\ \mathbf{A}_{i}e^{-ip^{\mu}x_{\mu}} \end{pmatrix} = 0;$$

an antiproton, equation of said antiproton being modeled as:

$$\begin{pmatrix} t-s & -\boldsymbol{\sigma}\cdot\mathbf{x}_i \\ -\boldsymbol{\sigma}\cdot\mathbf{x}_i & t+s \end{pmatrix}\begin{pmatrix} S_{e,+}e^{+iEt} \\ S_{i,-}e^{+iEt} \end{pmatrix} = 0, \quad \begin{pmatrix} t-\boldsymbol{\sigma}\cdot\mathbf{x}_i & -s \\ -s & t+\boldsymbol{\sigma}\cdot\mathbf{x}_i \end{pmatrix}\begin{pmatrix} S_{e,l}e^{+iEt} \\ S_{i,r}e^{+iEt} \end{pmatrix} = 0 \text{ or}$$

$$\begin{pmatrix} t & -s-i\boldsymbol{\sigma}\cdot\mathbf{x}_i \\ -s+i\boldsymbol{\sigma}\cdot\mathbf{x}_i & t \end{pmatrix}\begin{pmatrix} S_{e}e^{+iEt} \\ S_{i}e^{+iEt} \end{pmatrix} = 0; \text{ or}$$

a proton, equation of said proton being modeled as:

$$\begin{pmatrix} t-s & -\boldsymbol{\sigma}\cdot\mathbf{x}_i \\ -\boldsymbol{\sigma}\cdot\mathbf{x}_i & t+s \end{pmatrix}\begin{pmatrix} S_{e,-}e^{-iEt} \\ S_{i,+}e^{-iEt} \end{pmatrix} = 0, \quad \begin{pmatrix} t-\boldsymbol{\sigma}\cdot\mathbf{x}_i & -s \\ -s & t+\boldsymbol{\sigma}\cdot\mathbf{x}_i \end{pmatrix}\begin{pmatrix} S_{e,r}e^{-iEt} \\ S_{i,l}e^{-iEt} \end{pmatrix} = 0 \text{ or}$$

$$\begin{pmatrix} t & -s-i\boldsymbol{\sigma}\cdot\mathbf{x}_i \\ -s+i\boldsymbol{\sigma}\cdot\mathbf{x}_i & t \end{pmatrix}\begin{pmatrix} S_{e}e^{-iEt} \\ S_{i}e^{-iEt} \end{pmatrix} = 0.$$

(8) A method as in (6) wherein said elementary particle comprises an electron in said dual energy-momentum universe and said first representation is modified to include a proton, said

proton being modeled as a second elementary particle in said dual universe, and interaction fields of said electron and said proton, said modified first representation comprising:

$$1=e^{i0}=e^{i0}e^{i0}e^{i0}e^{i0}=\left(e^{i0}e^{i0}\right)_p\left(e^{i0}e^{i0}\right)_e=\left(e^{+iL-iM}e^{+iM-iM}\right)_p\left(e^{-iL+iL}e^{-iM+iM}\right)_e$$
$$=\left((\cos L+i\sin L)(\cos L-i\sin L)e^{+iM-iM}\right)_p\left((\cos L-i\sin L)(\cos L+i\sin L)e^{-iM+iM}\right)_e$$
$$=\left(\left(\frac{\tau}{t}+i\frac{|\mathbf{x}_i|}{t}\right)\left(\frac{\tau}{t}-i\frac{|\mathbf{x}_i|}{t}\right)e^{+ip^\mu x_\mu-ip^\mu x_\mu}\right)_p\left(\left(\frac{\tau}{t}-i\frac{|\mathbf{x}|}{t}\right)\left(\frac{\tau}{t}+i\frac{|\mathbf{x}|}{t}\right)e^{-ip^\mu x_\mu+ip^\mu x_\mu}\right)_e$$
$$=\left(\frac{t^2-\tau^2}{\mathbf{x}_i^2}e^{+ip^\mu x_\mu-ip^\mu x_\mu}\right)_p\left(\frac{t^2-\tau^2}{\mathbf{x}^2}e^{-ip^\mu x_\mu+ip^\mu x_\mu}\right)_e=$$
$$\left(\left(\frac{t-\tau}{-|\mathbf{x}_i|}\right)\left(\frac{-|\mathbf{x}_i|}{t+\tau}\right)^{-1}\left(e^{-ip^\mu x_\mu}\right)\left(e^{-ip^\mu x_\mu}\right)^{-1}\right)_p\left(\left(\frac{t-\tau}{-|\mathbf{x}|}\right)\left(\frac{-|\mathbf{x}|}{t+\tau}\right)^{-1}\left(e^{+ip^\mu x_\mu}\right)\left(e^{+ip^\mu x_\mu}\right)^{-1}\right)_e$$

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

where $(\boldsymbol{A}_{(\boldsymbol{p},E)},\phi_{(\boldsymbol{p},E)})$ & e are respectively four-potential & charge in said dual energy-momentum universe, $(\ )_e$ denotes electron, $(\ )_p$ denotes proton and $((\ )_e(\ )_p)$ denotes an electron-proton system.

(9) A method as in (6) wherein said elementary particle comprises an electron in said dual energy-momentum universe and said first representation is modified to include a unspinized proton, said unspinized proton being modeled as a second elementary particle in said dual universe, and interaction fields of said electron and said unspinized proton, said modified first representation comprising:

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

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

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

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

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

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

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

where $(\boldsymbol{A}_{(\boldsymbol{p},E)},\phi_{(\boldsymbol{p},E)})$ & e are respectively four-potential & charge in said dual energy-momentum universe, $(\ )_e$ denotes electron, $(\ )_p$ denotes unspinized proton and $((\ )_e(\ )_p)$ denotes an electron-unspinized proton system.

References

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