SYMMETRY FIELD IDEA

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ABSTRACT. In this paper [1] i will present model that can explain all Standard Model particles using symmetry and it can predict existence of new ones that are: anti-photon, anti-graviton, anti-gluon and graviton, first three are so called dark matter particles in this model. Workings of particle interaction here are very close to standard model, symmetry is exchanged (in SM its virtual force particle) that leads to change of energy state of particles interacting. To quantize all interaction i use Planck units as natural units, it leads to normalization without any kind of infinities. Spin is a rotation of field a physical rotation that is connected to energy of particle that is equal to symmetry exchange energy of particle.

1. Basic units

In this whole paper i will be using basic Plancks units [2], of energy, time , space and momentum. It means i can write any unit as $U = \frac{U_B}{U_P}$, where U is the unit used in theory and U_B, U_P are base units and Planck units. Any natural unit like second or meter can be converted to units used here by equation:

$$U_{nm} = \prod_n \prod_m \frac{U_{B_n} U_{P_m}}{U_{B_m} U_{P_n}} \tag{1.1}$$

Where n subscript means unit put into counter and m means unit put into denominator, B means base SI units and P means Planck's units. For many expressions with other units i need to add sum to it:

$$U_{n_g m_g} = \sum_g \prod_n \prod_m \frac{U_{B_{ng}} U_{P_{mg}}}{U_{B_{mg}} U_{P_{ng}}} \tag{1.2}$$

Where it means i can add units that are normally would be not compatible. And get a unit that is correct from point of view of this model. Only change is that Planck time and Planck length are defined as multiply by 2π. So i can write Planck time used here as and length:

$$L = 2\pi l_P \tag{1.3}$$

$$T = 2\pi t_P \tag{1.4}$$

It means Planck energy can be written as without reduced Planck's constant:

$$E = \frac{h}{T} = \frac{hc}{L} = m_P c^2 \tag{1.5}$$

Charge does change same way , it is multiplay by 2π so i can write it as:

$$Q = 2\pi q_P \tag{1.6}$$

And temperature is same equal to:

$$T = T_P = E_P k_B = E k_B \tag{1.7}$$

Where k_B is Boltzmann constant. Reason those units are multiply by 2π is spin nature of particles. I will quantize space-time so there is only movement by one unit of space per one unit of time as photon movement.

2. Quantizing space-time

I can create base vectors transformation from one frame to other, where E is energy of interaction in divided by Planck's energy, it means that in each point of space-time there is change of base vectors according to interaction energy at that point so i can write is as, and anti-field base vectors written with overline:

$$\hat{x}^{0'} = (1+E)\,\hat{x}^0 + -E\hat{x}^a \tag{2.1}$$

$$\hat{x}^{a'} = E\hat{x}^0 + (1+E)\,\hat{x}^a \tag{2.2}$$

$$\hat{\overline{x}}^{0'} = -\left(1+\overline{E}\right)\hat{x}^0 + \overline{E}\hat{x}^a \tag{2.3}$$

$$\hat{\overline{x}}^{a'} = -\overline{E}\hat{x}^0 - \left(1+\overline{E}\right)\hat{x}^a \tag{2.4}$$

Next there is a need for each particle to have a certain geometry in space and time, from idea of natural fixed units of time and space there comes a need to restrict value of both space and time component of vectors to natural numbers. Next step is take spin geometry as a sphere geometry but not one sphere but number of spheres N that is equal to denominator of spin number. Each of those sphere is connected by only one point $p_{N,N+1}$ that means first sphere is connected with second, second with third and so on only by one point, last need is that there is a line that crosses all those points $L(p_{N,N+1})$ it means all of those points lie on one line, i can write all of this formally a set of points equal to:

$$\begin{aligned}\left(X_n^N, T_m^N\right) :=& \begin{cases} X_n^N : \sum_a \left(X_1^a - C_1^a\right)^2 = n^2 \wedge ... \sum_a \left(X_N^a - C_N^a\right)^2 = n^2 \\ T_m : T_m^2 = m^2 \end{cases} \\ &\wedge \left\{X_n^N\right\} \cap \left\{X_n^{N+1}\right\} = \left\{p_{N,N+1}\right\} \in L(p_{N,N+1}) \\ &\wedge \left(X_n^N, T_m^N\right) \\ =& \left\{\left\{X_n^N + \epsilon^{-1^N}(X_n^N), T_m^N\right\} \cup \left\{p_{N,N+1}^{(-1)^{N+1}}\right\}\right\} \setminus \left\{p_{N,N+1}\right\}\end{aligned} \tag{2.5}$$

Any vector field that exist in that space can be written as one point in space of that set and it transforms according to that rule of base vector change depending on energy of interaction, so i write vector field V^α as and anti vector field $\overline{V}^{\alpha}$:

$$V^{\alpha}(\mathbf{x})' = \hat{R}_{x^0 x^a}(\varphi) V^{\alpha}(\bigcup_N \hat{R}_{x^0 x^a}((-1)^{N+1}\varphi)\mathbf{x}_N)\Big|_{(\exists (x_N^a) \in \bigcup_N X_n^N, \bigcup_N (x^0) \in T_m^N)} \tag{2.6}$$

$$\overline{V}^{\alpha}(\overline{\mathbf{x}})' = \hat{R}_{\overline{x}^0 \overline{x}^a}(\varphi) \overline{V}^{\alpha}(\bigcup_N \hat{R}_{\overline{x}^0 \overline{x}^a}((-1)^{N+1}\varphi)\overline{\mathbf{x}}_N)\Big|_{(\exists (\overline{x}_N^a) \in -\bigcup_N X_n^N, \bigcup_N (\overline{x}^0) \in -T_m^N)} \tag{2.7}$$

Where $\varphi = \cot^{-1}\left(\frac{1+E}{-E}\right)$ and $\hat{R}$ is rotation operator of normal four dimension space with rotation around vector space field component $V^a(\mathbf{x})$ and time . Where coordinates are rotating with vector field. Points with upper script are equal to (third coordinate is that one around its rotated):

$$p_{N,N+1}^{1} = (p_{N,N+1}^{1}, p_{N,N+1}^{2}, p_{N,N+1}^{3} + \epsilon) \tag{2.8}$$

$$p_{N,N+1}^{-1} = (p_{N,N+1}^{1}, p_{N,N+1}^{2}, p_{N,N+1}^{3} - \epsilon) \tag{2.9}$$

$$p_{N,N+1}^{-L} = (p_{N,N+1}^{1}, p_{N,N+1}^{2} - \epsilon, p_{N,N+1}^{3} - \epsilon) \tag{2.10}$$

$$p_{N,N+1}^{L} = (p_{N,N+1}^{1}, p_{N,N+1}^{2} + \epsilon, p_{N,N+1}^{3} + \epsilon) \tag{2.11}$$

$$\lim_{X_n^N \to p_{N,N+1}^{-L}} \epsilon^{-}(X_n^N) = (0, 0, -2\epsilon) \tag{2.12}$$

$$\lim_{X_n^N \to p_{N,N+1}^{1}} \epsilon^{-}(X_n^N) = (0, 0, 0) \tag{2.13}$$

$$\lim_{X_n^N \to p_{N,N+1}^{L}} \epsilon^{+}(X_n^N) = (0, 0, 2\epsilon) \tag{2.14}$$

$$\lim_{X_n^N \to p_{N,N+1}^{-1}} \epsilon^{+}(X_n^N) = (0, 0, 0) \tag{2.15}$$

Where ϵ is very small non zero number and (x_N^a) represent space points of coordinate system where (x^0) represents time points of coordinate system so that: $(\mathbf{x}_N) = (x_N^a, x^0)$.

3. Symmetries and spin

Base idea is that all elementary particles can be produced out of symmetries states. There are two symmetries i will use in this model, that can have positive value S_{+1}, S_{+2} or negative value S_{-1}, S_{-2}. Positive value means that symmetry is fulfilled , negative that its not. There are four possible combinations of spin values that can be represented as a matrix, where v_{nm} represents state and can be equal to one , zero or negative one:

$$\hat{S} = \begin{pmatrix} \frac{1}{2}v_{11}S_{+1} & \frac{1}{2}v_{12}S_{+2} \\ \frac{1}{2}v_{21}S_{-1} & \frac{1}{2}v_{22}S_{+2} \\ \frac{1}{2}v_{31}S_{+1} & \frac{1}{2}v_{32}S_{-2} \\ \frac{1}{2}v_{41}S_{-1} & \frac{1}{2}v_{42}S_{-2} \end{pmatrix} = \begin{pmatrix} \frac{1}{2}v_{11}S_{+1} & \frac{1}{2}v_{12}S_{+2} \\ -\frac{1}{2}v_{21}S_{+1} & \frac{1}{2}v_{22}S_{+2} \\ \frac{1}{2}v_{31}S_{+1} & -\frac{1}{2}v_{32}S_{+2} \\ -\frac{1}{2}v_{41}S_{+1} & -\frac{1}{2}v_{42}S_{+2} \end{pmatrix} \tag{3.1}$$

Symmetry number for a given system is equal to sum of this matrix elements $S = \sum_{n,m} S_{nm}$, if first symmetry is fulfilled it means that system is massless $E_0 = 0$ second symmetry is fulfilled when energy states change so for given system there is not one energy state E but many E_n and they are not equal $(E_0 \neq E_1 ... \neq E_n)$, when first symmetry is not fulfilled then system has mass $E_0 \neq 0$ and when second is not fulfilled all energy states are equal $(E_0 = E_1 ... = E_n)$. Spin number [3] for a given system is equal to its absolute value of symmetry $|S|$ and from it i can create symmetry-spin function $\rho(\phi)$ that has $N = \phi$ states, N part of function represents N spin probability state. For bosons i can have states of spin number that is equal to $N = 2|S| + 1$ where they go from positive spin $|S|$ then positive spin $|S| - 1$ and so on till they get to zero $(|S| - n = 0)$, then they go from negative $-|S| + n \neq 0$ till $-|S| + 0$ and for fermions they go from $|S|$ to $|S| - 1/2n \neq 0$ and then from $-|S| + 1/2n$ to $-|S| + 0$. Where for bosons $|S| = 0, 1, 2...$ for fermions $|S| = 1/2, 3/2...$,each state has one where column number is equal to N state. So its not one vector but N vectors for spin 1/2 particles its $N = 2$ where they get positive and negative spin states. Generally N is number of all states, for bosons its easy to calculate its just $N = 2|S| + 1 = 2p + 1$ where $|S|$ is symmetry number, for fermions its more complex for each spin state there is one number so if i have N states where $N/2$ are positive states and $N/2 + 1...N$ are negative states this number N is number of all possible negative and positive states. It connects to spin number by $|S| - 1/2n \geq 0$ so i get $N = 2p$

where $n = 1, 3..., 2p - 1$. So from spin number i can get possible spin state number by (subscript F means fermions, B bosons):

$$Y_{F_p} = \begin{cases} 1/2(2p-1) \wedge p > 0 \\ 1/2(2p+1) \wedge p < 0 \end{cases}_{-|S(\mathbf{x})| \le Y_{F_p} \le |S(\mathbf{x})|} \tag{3.2}$$

$$Y_{B_p} = p \wedge p \in \mathbb{Z}|_{-|S(\mathbf{x})| \le Y_{B_p} \le |S(\mathbf{x})|} \tag{3.3}$$

Where angle θ is defined as for spin state ϕ for fermions:

$$\theta_{k(\phi)F}(\mathbf{x})\Big|_{x^0}^{x^0+\delta x^0_{nmij}} = \begin{cases} \theta_{k(\phi)}(\mathbf{x}) = +\theta(\mathbf{x}) \to \phi = 1, ..., N/2 \to (Y_{F_m} > 0) \\ \theta_{k(\phi)}(\mathbf{x}) = -\theta(\mathbf{x}) \to \phi = N/2+1, ..., N \to (Y_{F_m} < 0) \end{cases} \tag{3.4}$$

For bosons its same but i need to add zero energy state that is equal to:

$$\theta_{k(\phi)B}(\mathbf{x})\Big|_{x^0}^{x^0+\delta x^0_{nmij}} = \begin{cases} \theta_{k(\phi)}(\mathbf{x}) = +\theta(\mathbf{x}) \to \phi = 1, ..., N/2 \to (Y_{B_m} > 0) \\ \theta_{k(\phi)}(\mathbf{x}) = 0 \to \phi = N/2+1 \to (Y_{B_m} = 0) \\ \theta_{k(\phi)}(\mathbf{x}) = -\theta(\mathbf{x}) \to \phi = N/2+2, ..., N+1 \to (Y_{B_m} < 0) \end{cases} \tag{3.5}$$

Positive angle represents positive spin $Y_p > 0$ state and negative angle represents negative spin $Y_p < 0$ state. So i can write full angle as:

$$\dot{\theta}(\mathbf{x})\Big|_{x^0}^{x^0+\delta x^0_{nmij}} = \frac{\theta(x^0 + \delta x^0, \mathbf{x^a}) - \theta(\mathbf{x})}{\delta x^0}\Bigg|_{x^0}^{x^0+\delta x^0_{nmij}} \tag{3.6}$$

4. Spin forms

Now i can combine spin with space-time geometry. Lets say i have a tensor field, that has property of going back to its initial state after rotation by $\frac{2\pi}{s}$ where $s = |S|$ is spin number. It rotates by angle θ that comes from spin state, for any spin number i can write it as $s = \frac{h}{N}$ where h is number of vectors and N number of spheres. So angle of h vector is equal to:

$$\omega_h = \left(\theta + \frac{2\pi(h-1)}{s}\right) \tag{4.1}$$

From it i create spin operator for spin form that is equal to:

$$R^\alpha_\beta = \hat{R}\left(\varphi\right)_{x^0 x^a} \hat{R}\left(\omega_h\right)_{x^q x^p} \tag{4.2}$$

$$R^\beta_\alpha = \hat{R}^T\left(\varphi\right)_{x^0 x^a} \hat{R}^T\left(\omega_h\right)_{x^q x^p} \tag{4.3}$$

$$\hat{F}_h\left(\varphi\right) = \begin{pmatrix} 1 & 1 & 1 & 1 & 1 \\ 1 & R^0_0 & R^0_1 & R^0_2 & R^0_3 \\ 1 & R^1_0 & R^1_1 & R^1_2 & R^1_3 \\ 1 & R^2_0 & R^2_1 & R^2_2 & R^2_3 \\ 1 & R^3_0 & R^3_1 & R^3_2 & R^3_3 \end{pmatrix} \qquad \hat{F}^T_h\left(\varphi\right) = \begin{pmatrix} 1 & 1 & 1 & 1 & 1 \\ 1 & R^0_0 & R^1_0 & R^2_0 & R^3_0 \\ 1 & R^0_1 & R^1_1 & R^2_1 & R^3_1 \\ 1 & R^2_0 & R^1_2 & R^2_2 & R^3_2 \\ 1 & R^0_3 & R^1_3 & R^2_3 & R^3_3 \end{pmatrix} \tag{4.4}$$

And for anti field it is equal to:

$$\overline{R}^\alpha_\beta = \hat{R}\left(\varphi\right)_{\overline{x}^0 \overline{x}^a} \hat{R}\left(\omega_h\right)_{\overline{x}^q \overline{x}^p} \tag{4.5}$$

$$\overline{R}^\beta_\alpha = \hat{R}^T\left(\varphi\right)_{\overline{x}^0 \overline{x}^a} \hat{R}^T\left(\omega_h\right)_{\overline{x}^q \overline{x}^p} \tag{4.6}$$

$$\hat{\overline{F}}_h\left(\varphi\right) = \begin{pmatrix} 1 & 1 & 1 & 1 & 1 \\ 1 & \overline{R}^0_0 & \overline{R}^0_1 & \overline{R}^0_2 & \overline{R}^0_3 \\ 1 & \overline{R}^1_0 & \overline{R}^1_1 & \overline{R}^1_2 & \overline{R}^1_3 \\ 1 & \overline{R}^2_0 & \overline{R}^2_1 & \overline{R}^2_2 & \overline{R}^2_3 \\ 1 & \overline{R}^3_0 & \overline{R}^3_1 & \overline{R}^3_2 & \overline{R}^3_3 \end{pmatrix} \qquad \hat{\overline{F}}^T_h\left(\varphi\right) = \begin{pmatrix} 1 & 1 & 1 & 1 & 1 \\ 1 & \overline{R}^0_0 & \overline{R}^1_0 & \overline{R}^2_0 & \overline{R}^3_0 \\ 1 & \overline{R}^0_1 & \overline{R}^1_1 & \overline{R}^2_1 & \overline{R}^3_1 \\ 1 & \overline{R}^2_0 & \overline{R}^1_2 & \overline{R}^2_2 & \overline{R}^3_2 \\ 1 & \overline{R}^0_3 & \overline{R}^1_3 & \overline{R}^2_3 & \overline{R}^3_3 \end{pmatrix} \tag{4.7}$$

Spin form is defined as a pseudotensor that does transform this way when rotated so i can write spin form transformation rule as :

$$\sigma^{\alpha\beta}(\mathbf{x}) = \sum_h F_h \sigma^{\alpha\beta}\left(\bigcup_N F\left(\left(-1\right)^{N+1}\varphi\right)\mathbf{x}_N\right) F^T_h \Bigg|_{\left(\exists\left(x^a_N\right)\in\bigcup_N X^N_n, \bigcup_N\left(x^0\right)\in T^N_m\right)} \tag{4.8}$$

Where spin form is equal to:

$$\sigma^{\alpha\beta}(\mathbf{x}) = \left.\begin{pmatrix} S^2(\mathbf{x}) & SV^{\beta}(\mathbf{x}) \\ S(\mathbf{x})V^{\alpha}(\mathbf{x}) & V^{\alpha}(\mathbf{x})V^{\beta}(\mathbf{x}) \end{pmatrix}\right|_{(\exists x^a \in X_n, x^0 \in T_n)_N} \tag{4.9}$$

$$V^{\alpha}(\mathbf{x}) = \sum_{n,m} \sum_{i,j \neq n,m} \begin{pmatrix} r_k(\mathbf{x}) x^0_{nmijk}(\mathbf{x}) \\ x^1_{nmijk}(\mathbf{x}) \\ x^2_{nmijk}(\mathbf{x}) \\ x^3_{nmijk}(\mathbf{x}) \end{pmatrix} \tag{4.10}$$

$$V^{\beta}(\mathbf{x}) = \sum_{n,m} \sum_{i,j \neq n,m} \begin{pmatrix} r_l(\mathbf{x}) x^0_{nmijl}(\mathbf{x}) \\ x^1_{nmijl}(\mathbf{x}) \\ x^2_{nmijl}(\mathbf{x}) \\ x^3_{nmijl}(\mathbf{x}) \end{pmatrix} \tag{4.11}$$

And same but for anti-field is:

$$\overline{\sigma}^{\alpha\beta}(\overline{\mathbf{x}}) = \left.\sum_{h} \overline{F}_h \overline{\sigma}^{\alpha\beta} \left(\bigcup_N \overline{F} \left((-1)^{N+1} \varphi \right) \overline{\mathbf{x}}_N \right) \overline{F}^T_h \right|_{(\exists (\overline{x}^a_N) \in -\bigcup_N X^N_n, \bigcup_N (\overline{x}^0) \in -T^N_m)} \tag{4.12}$$

Where spin form is equal to:

$$\overline{\sigma}^{\alpha\beta}(\overline{\mathbf{x}}) = \left.\begin{pmatrix} \overline{S}^2 & \overline{SV}^{\beta}(\overline{\mathbf{x}}) \\ \overline{SV}^{\alpha}(\overline{\mathbf{x}}) & \overline{V}^{\alpha}(\overline{\mathbf{x}})\overline{V}^{\beta}(\overline{\mathbf{x}}) \end{pmatrix}\right|_{(\exists (\overline{x}^a_N) \in -\bigcup_N X^N_n, \bigcup_N (\overline{x}^0) \in -T^N_m)} \tag{4.13}$$

$$\overline{V}^{\alpha}(\overline{\mathbf{x}}) = \sum_{n,m} \sum_{i,j \neq n,m} \begin{pmatrix} \overline{r}_k(\overline{\mathbf{x}}) \overline{x}^0_{nmijk}(\overline{\mathbf{x}}) \\ \overline{x}^1_{nmijk}(\overline{\mathbf{x}}) \\ \overline{x}^2_{nmijk}(\overline{\mathbf{x}}) \\ \overline{x}^3_{nmijk}(\overline{\mathbf{x}}) \end{pmatrix} \tag{4.14}$$

$$\overline{V}^{\beta}(\overline{\mathbf{x}}) = \sum_{n,m} \sum_{i,j \neq n,m} \begin{pmatrix} \overline{r}_l(\overline{\mathbf{x}}) \overline{x}^0_{nmijl}(\overline{\mathbf{x}}) \\ \overline{x}^1_{nmijl}(\overline{\mathbf{x}}) \\ \overline{x}^2_{nmijl}(\overline{\mathbf{x}}) \\ \overline{x}^3_{nmijl}(\overline{\mathbf{x}}) \end{pmatrix} \tag{4.15}$$

5. Energy from symmetry exchange

I can write energy and angular energy for many bodies as:

$$E_{kl}(\mathbf{x})\Big|_{x_k^0x_l^0}^{x_k^0x_l^0+x_{nmijk}^0x_{nmijl}^0r_kr_l} = 2V(k,l)\left|\sum_{n,m}\sum_{i,j\neq n,m}\frac{S_{nmijk}S_{nmijl}}{x_{nmijk}^0x_{nmijl}^0r_kr_l}\right| \tag{5.1}$$

$$J_{kl}(\mathbf{x})\Big|_{x_k^0x_l^0}^{x_k^0x_l^0+x_{nmijk}^0x_{nmijl}^0r_kr_l} = 2f(k,l)\left|\sum_{n,m}\sum_{i,j\neq n,m}\frac{S_{nmijk}S_{nmijl}}{x_{nmijk}^0x_{nmijl}^0r_kr_l}\right| \tag{5.2}$$

$$\overline{E}_{kl}(\overline{\mathbf{x}})\Big|_{\overline{x}_k^0\overline{x}_l^0}^{\overline{x}_k^0\overline{x}_l^0+\overline{x}_{nmijk}^0\overline{x}_{nmijk}^0\overline{r}_k\overline{r}_l} = 2V(k,l)\left|\sum_{n,m}\sum_{i,j\neq n,m}\frac{\overline{S}_{nmijk}\overline{S}_{nmijl}}{\overline{x}_{nmijk}^0\overline{x}_{nmijl}^0\overline{r}_k\overline{r}_l}\right| \tag{5.3}$$

$$\overline{J}_{kl}(\overline{\mathbf{x}})\Big|_{\overline{x}_k^0\overline{x}_l^0}^{\overline{x}_k^0\overline{x}_l^0+\overline{x}_{nmijk}^0\overline{x}_{nmijk}^0\overline{r}_k\overline{r}_l} = 2f(k,l)\left|\sum_{n,m}\sum_{i,j\neq n,m}\frac{\overline{S}_{nmijk}\overline{S}_{nmijl}}{\overline{x}_{nmijk}^0\overline{x}_{nmijl}^0\overline{r}_k\overline{r}_l}\right| \tag{5.4}$$

Where function $f(k,l)$ and $V(n,m)$ is equal to (sgn is signum function):

$$f(k,l) := \begin{cases} 1 \Rightarrow k = l \wedge Y_{k_p} = Y_{l_p} > 0 \\ -1 \Rightarrow k = l \wedge Y_{k_p} = Y_{l_p} < 0 \\ -1 \Rightarrow k \neq l \wedge Y_{l_p} < 0 \wedge f(l,k) \\ -1 \Rightarrow k \neq l \wedge Y_{k_p} < 0 \wedge f(k,l) \\ 1 \Rightarrow k \neq l \wedge Y_{k_p} < 0 \wedge f(k,l) \\ 1 \Rightarrow k \neq l \wedge Y_{l_p} < 0 \wedge f(l,k) \\ 0 \Rightarrow Y_{l_p} = 0 \vee Y_{k_p} = 0 \vee Y_{l_p} = Y_{k_p} = 0 \end{cases} \tag{5.5}$$

$$V(k,l) := \begin{cases} \operatorname{sgn}(S_{nmijkk}) \wedge V(k,k) \\ \operatorname{sgn}(S_{nmijll}) \wedge V(l,l) \\ \operatorname{sgn}(S_{nmijkl}) \to S_{nmijkl} = S_{nmijlk} \wedge V(k,l) \\ \operatorname{sgn}(S_{nmijlk}) \to S_{nmijkl} = S_{nmijlk} \wedge V(l,k) \\ -1 \to S_{nmijkl} \neq S_{nmijlk} \wedge V(k,l) \\ -1 \to S_{nmijkl} \neq S_{nmijlk} \wedge V(l,k) \\ 0 \to S_{nmijkl} = S_{nmijlk} = 0 \vee S_{nmijlk} = 0 \vee S_{nmijkl} = 0 \end{cases} \tag{5.6}$$

From it there is electric charge calculation:

$$Q(\mathbf{x})\Big|_{x^0}^{x^0+rx^0_{n1ij}}\Bigg|_{x^0}^{x^0+rx^0_{n2ij}} = 2\frac{S}{|S|}\left(\sum_{n=2,3}\sum_{i=2,3,j\neq n=1,2}\left|\frac{S_{n1ij}}{rx^0_{n1ij}}\right|\right)$$
$$+2\frac{S}{|S|}\left(\sum_{n=2,3}\sum_{i=2,3,j\neq n=1,2}\left|\frac{S_{n2ij}}{rx^0_{n2ij}}\right|\right) \tag{5.7}$$

Electric field created by charges energy is equal to (where α is fine structure constant [5]):

$$\Phi_{kl}(\mathbf{x})\Big|_{x^0_k x^0_l}^{x^0_k x^0_k + r_k r_l x^0_{n1ijk} x^0_{n1ijl}}\Bigg|_{x^0_k x^0_l}^{x^0_k x^0_l + r_k r_l x^0_{n2ijk} x^0_{n2ijl}} = \sum_{k,l}\alpha q(k,l) Q^2_{kl}(\mathbf{x}) \tag{5.8}$$

$$q(k,l) = \begin{cases} + \to \operatorname{sgn}(Q_{kl}(\mathbf{x}) = \operatorname{sgn}(Q_{kl}(\mathbf{x})) \\ - \to \operatorname{sgn}(Q_{kl}(\mathbf{x})) \neq \operatorname{sgn}(Q_{kl}(\mathbf{x})) \end{cases} \tag{5.9}$$

$$Q_{kl}(\mathbf{x})\Big|_{x^0_k x^0_l}^{x^0_k x^0_k + r_k r_l x^0_{n1ijk} x^0_{n1ijl}}\Bigg|_{x^0_k x^0_l}^{x^0_k x^0_l + r_k r_l x^0_{n2ijk} x^0_{n2ijl}} =$$
$$2\frac{S_{kl}}{|S_{kl}|}\left(\sum_{n=2,3}\sum_{i=2,3,j\neq n=1,2}\left|\frac{S_{n1ijk}S_{n1ijl}}{x^0_{n1ijk} r_k x^0_{n1ijl} r_l}\right|\right)$$
$$+2\frac{S_{kl}}{|S_{kl}|}\left(\sum_{n=2,3}\sum_{i=2,3,j\neq n=1,2}\left|\frac{S_{n1ijk}S_{n1ijl}}{x^0_{n1ijk} r_k x^0_{n1ijl} r_l}\right|\right) \tag{5.10}$$

Energy and angular momentum must be conserved so i can write it as:

$$\sum_{k,l}\left(\dot{E}_{kl} + \dot{\overline{E}}_{kl}\right) = 0 \tag{5.11}$$

$$\sum_{k,l}\left(\dot{J}_{kl} + \dot{\overline{J}}_{kl}\right) = 0 \tag{5.12}$$

It does apply to electric charge so i can write it as:

$$\sum_{k,l}\left(\dot{Q}_{kl} + \dot{\overline{Q}}_{kl}\right) = 0 \tag{5.13}$$

From symmetry model i can map all particles of Standard Model [4] to symmetry states. I will use a table with matter (symmetrical state) and anti-matter (anti-symmetrical), where i use matrix S_{nm} elements with v_{nm} states as a sign :

Elementary Particles	
Particle	Matter State (symmetrical)
Photon	$+S_{11}, +S_{12}$
Electron/Muon/Tau	$-S_{11}, +S_{21}, +S_{22}$
Quarks (up, charm, top)	$-S_{11}, +S_{12}, +S_{21}, +S_{31}, -S_{32}$
Quarks (down, strange, bottom)	$+S_{11}, -S_{12}, -S_{21}, -S_{31}, +S_{32}$
Graviton	$+S_{11}, +S_{12}, -S_{41}, -S_{42}$
Higgs Boson	$+S_{11}, -S_{12}$
$W^{\pm}$ Boson	$-S_{11}, +S_{12}, -S_{21}, +S_{22}$
Z Boson	$+S_{41}, +S_{42}$
Neutrino	$+S_{12}, +S_{41}, -S_{42}$
Gluon	$+S_{11}, +S_{12}, -S_{41}, +S_{42}$

Elementary Particles	
Particle	Anti-Matter State (anti-symmetrical)
Photon	$-S_{11}, -S_{12}$
Electron/Muon/Tau	$+S_{11}, -S_{21}, -S_{22}$
Quarks (up, charm, top)	$+S_{11}, -S_{12}, -S_{21}, -S_{31}, +S_{32}$
Quarks (down, strange, bottom)	$-S_{11}, +S_{12}, +S_{21}, +S_{31}, -S_{32}$
Graviton	$-S_{11}, -S_{12}, +S_{41}, +S_{42}$
Higgs Boson	$-S_{11}, +S_{12}$
$W^{\pm}$ Boson	$+S_{11}, -S_{12}, +S_{21}, -S_{22}$
Z Boson	$-S_{41}, -S_{42}$
Neutrino	$-S_{12}, -S_{41}, +S_{42}$
Gluon	$-S_{11}, -S_{12}, +S_{41}, -S_{42}$

6. Symmetry field

Symmetry field is a tensor field that goes in all possible paths , i can write it as sum of integrals with probability amplitude A_W:

$$\sum_W S_W^{\alpha\beta}(\mathbf{x}) = \sum_W \left[\sum_{P_N} \sum_{k,l} A_W \dot{\sigma}_{kl}^{\alpha\beta}(x^a + \epsilon_{X_{P_W}}, x^0 + \epsilon_{T_{P_W}}) \right] \tag{6.1}$$

Probability amplitude is equal to number of steps of time and space:

$$A_W = \sqrt{\frac{\rho(\phi)}{\sum_\phi \rho(\phi)} \frac{\sum_{P_W} \left(\epsilon_{X_{P_N}} + \epsilon_{T_{P_W}} \right)}{\sum_W \left(\sum_{P_W} \left(\epsilon_{X_{P_W}} + \epsilon_{T_{P_W}} \right) \right)}} \tag{6.2}$$

Symmetry field has an anti-symmetrical state that has to be represented same way as, where overline coordinates are with minus sign of normal coordinates:

$$\sum_W \overline{S}_W^{\alpha\beta}(\overline{\mathbf{x}}) = \sum_W \left[\sum_{P_N} \sum_{k,l} \overline{A}_W \dot{\overline{\sigma}}_{kl}^{\alpha\beta}(\overline{\mathbf{x}}^a + \overline{\epsilon}_{X_{P_W}}, \overline{x}^0 + \overline{\epsilon}_{T_{P_W}}) \right] \tag{6.3}$$

I can define amplitude for anti-symmetrical field as:

$$\overline{A}_W = \sqrt{\frac{\overline{\rho}(\phi)}{\sum_\phi \overline{\rho}(\phi)} \frac{\sum_{P_W} \left(\overline{\epsilon}_{X_{P_W}} + \overline{\epsilon}_{T_{P_W}} \right)}{\sum_W \left(\sum_{P_W} \left(\overline{\epsilon}_{X_{P_W}} + \overline{\epsilon}_{T_{P_W}} \right) \right)}} \tag{6.4}$$

For both field probability of path P_N is equal to:

$$\rho(P_N) = A_W^2 = \frac{\rho(\phi)}{\sum_\phi \rho(\phi)} \frac{\sum_{P_W} \left(\epsilon_{X_{P_W}} + \epsilon_{T_{P_W}} \right)}{\sum_W \left(\sum_{P_W} \left(\epsilon_{X_{P_W}} + \epsilon_{T_{P_W}} \right) \right)} \tag{6.5}$$

$$\rho(P_N) = \overline{A}_W^2 = \frac{\overline{\rho}(\phi)}{\sum_\phi \overline{\rho}(\phi)} \frac{\sum_{P_W} \left(\overline{\epsilon}_{X_{P_W}} + \overline{\epsilon}_{T_{P_W}} \right)}{\sum_W \left(\sum_{P_W} \left(\overline{\epsilon}_{X_{P_W}} + \overline{\epsilon}_{T_{P_W}} \right) \right)} \tag{6.6}$$

After measurement field changes state from sum of all states to one state W with one path:

$$\rho(P_W, \phi) : A_W \sum_W S_W^{\alpha\beta}(\mathbf{x}) \xrightarrow{M} S_W^{\alpha\beta}(\mathbf{x}) \tag{6.7}$$

$$\overline{\rho}(P_W, \phi) : \overline{A}_W \sum_W \overline{S}_W^{\alpha\beta}(\overline{\mathbf{x}}) \xrightarrow{M} \overline{S}_W^{\alpha\beta}(\overline{\mathbf{x}}) \tag{6.8}$$

7. Consevartion laws and evolution

There are five simple conservation laws that say what event is possible. Conservation of symmetry for field and anti-field and conservation of symmetry field density in all directions with anti-field symmetry density:

$$\sum_{k,l} \dot{S}_{kl}^2 + \dot{\overline{S}}_{kl}^2 = 0 \tag{7.1}$$

$$\left(\sum_{k,l} \partial_0 S_{kl} V_{kl}^{\alpha} + \partial_0 S_{kl} V_{kl}^{\beta}\right) + \left(\sum_{k,l} \partial_0 \overline{S}_{kl} \overline{V}_{kl}^{\alpha} + \partial_0 \overline{S}_{kl} \overline{V}_{kl}^{\beta}\right) = 0 \tag{7.2}$$

Energy of field and anti-field conservation and angular momentum:

$$\sum_{k,l} \left(\dot{E}_{kl} + \dot{\overline{E}}_{kl}\right) = 0 \tag{7.3}$$

$$\sum_{k,l} \left(\dot{J}_{kl} + \dot{\overline{J}}_{kl}\right) = 0 \tag{7.4}$$

And finally electric charge conservation:

$$\sum_{k,l} \left(\dot{Q}_{kl} + \dot{\overline{Q}}_{kl}\right) = 0 \tag{7.5}$$

I can create a scalar field out of it that density Lagrangian is equal to:

$$\sum_{W} \mathfrak{L}_W = \sum_{W} \sum_{\alpha,\beta} \nabla S_W^{\alpha\beta} - \left(\sum_{k,l} \dot{S}_{kl}^2 + \partial_0 S_{kl} V_{kl}^{\alpha} + \partial_0 S_{kl} V_{kl}^{\beta} + \dot{E}_{kl}^2 + \dot{J}_{kl}^2 + \dot{Q}_{kl}^2\right) \tag{7.6}$$

$$\sum_{W} \overline{\mathfrak{L}}_W = \sum_{W} \sum_{\alpha,\beta} \nabla \overline{S}_W^{\alpha\beta} - \left(\sum_{k,l} \dot{\overline{S}}_{kl}^2 + \partial_0 \overline{S}_{kl} \overline{V}_{kl}^{\alpha} + \partial_0 \overline{S}_{kl} \overline{V}_{kl}^{\beta} + \dot{\overline{E}}_{kl}^2 + \dot{\overline{J}}_{kl}^2 + \dot{\overline{Q}}_{kl}^2\right) \tag{7.7}$$

So equation of motion is:

$$\sum_{W} \mathfrak{L}_W + \overline{\mathfrak{L}}_W = 0 \tag{7.8}$$

After measurement field density changes state from sum of all states to one state W with one path:

$$\rho(P_W, \phi) : \sum_{W} \mathfrak{L}_W \xrightarrow{M} \mathfrak{L}_W \tag{7.9}$$

$$\overline{\rho}(P_W, \phi) : \sum_{W} \overline{\mathfrak{L}}_W \xrightarrow{M} \overline{\mathfrak{L}}_W \tag{7.10}$$

References

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