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All Elementary Bosons are Gauge

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Abstract: All concepts and laws of the Standard Model without Higgs and laws of Newtonian gravity derived from the properties of dot events probability. The Dirac type equation with additional gauge fields, the invariant under electroweak transformation fermions masses, *W* and *Z* bosons with dynamic masses are obtained from such probability properties. Newton's law of gravity, the phenomenon of confinement and asymptotic freedom is also a consequence of these properties.

Keywords: Dot Event, TheDirac Equation, Fermion, Boson, Weak Isospin

1. Introduction

Yu. A. Golfandand, E. P. Likhtman (1971), B. Sakita and J. L. Gervais (1971), and D. V. Volkov and V. P. Akulov (1972),start consider super symmetry, which establishes a relationship between elementary particles of different quantum nature, bosons and fermions.

It was hoped that this theory will solve problems such as the hierarchy problem of the Standard Model, the Dark Matter and Dark Energy problem, problem of unification of theweak, the electromagnetic and strong interactions, theory of super gravity. It is also seemed a necessary feature of the most popular candidate for a theory of everything, super string theory.

But for decades or LEP or Tevatron or LHS, and no other experiments around the world have found no trace of super symmetry.

2. Dot Event and Probability

Events, each of which can bound to a certain point in space-time, are called *dot events* [1,2,3,4.5,6].

Combinations (sums, products, supplements) of such events are called *physical events*.

The probability density of dot events in space-time is invariant under Lorentz transformations. But probability density of such events in space at a certain instant of time is not invariant under these transformations, [8, pp.58—59].

I consider the dot events for which density of probability in space at some instant of time is the null component of a 3+1-vector function which is transformed by the Lorentz formulas [8, pp.58—59]. I call these probabilities *traceable probabilities*.

Let $j_A := \langle c\rho_A, j_A\rangle$ be the current 3+1-vector of probability density of a dot event *A*.

The following set of 4 complex equations with unknown 4×1-matrix complex function φ(x) has solutions for any *A* [8, p.59--63]:

$$\begin{cases} \varphi^\dagger \varphi = \rho_A, \\ \varphi^\dagger \beta^{[\nu]} \varphi = -\frac{j_{A,\nu}}{c} \end{cases}$$

here: $\nu \in \{1,2,3\}$,

$$\beta^{[\nu]} := \begin{bmatrix} \sigma_\nu & 0_2 \\ 0_2 & -\sigma_\nu \end{bmatrix} \tag{1}$$

where σ_ν are the Pauli matrices, and 0_2 is the zero 2×2 matrix.

If $\rho_A(x) = 0$for all x such that $|x| \geq \pi c/\mathrm{h}$ then [8, pp. 80--81] φ obeys the following equation:

$$\partial_t \varphi = \mathrm{c}\left(\sum_{\nu=1}^{3} \beta^{[\nu]} \partial_\nu + \hat{Q}\right)\varphi \tag{2}$$

here: $Q_{\nu,\mu}^{\dagger} = -Q_{\mu,\nu}$.

If

$$\gamma^{[0]}:=\begin{bmatrix}0_2 & 1_2\\ 1_2 & 0_2\end{bmatrix}, \text{ and } \beta^{[4]}:=\mathrm{i}\begin{bmatrix}0_2 & -1_2\\ 1_2 & 0_2\end{bmatrix}.$$

where 1_2 is the identical 2×2 matrix, then matrices $\beta^{[\nu]}$ with matrices $\gamma^{[0]}$and $\beta^{[4]}$ form a Clifford pentad [8, p.59].

There four similar pentads exist [8, 59--60]: I call one of them (the pentad (β) *light pentad,* and three (ζ, η, θ) - *chromatic pentads.*

Then equation (2) can be rewritten as the following:

$$\left(\sum_{\nu=0}^{3}\beta^{[\nu]}\left(\partial_\nu+\mathrm{i}\Theta_\nu+\mathrm{i}\Upsilon_\nu\gamma^{[5]}\right)+\mathrm{i}M_0\gamma^{[0]}+\mathrm{i}M_4\beta^{[4]}\right.$$
$$-\mathrm{i}M_{\zeta,0}\gamma_\zeta^{[0]}+\mathrm{i}M_{\zeta,4}\zeta^{[4]}-\mathrm{i}M_{\eta,0}\gamma_\eta^{[0]}+\mathrm{i}M_{\eta,4}\eta^{[4]}+$$
$$\left.+\mathrm{i}M_{\theta,0}\gamma_\theta^{[0]}+\mathrm{i}M_{\theta,4}\theta^{[4]}\right)\varphi=0 \qquad (3)$$

here $\beta^{[0]}:=-1_4$, $\Theta_k(t,x)$, $\Upsilon_k(t,x)$, $M_0(t,x)$, $M_4(t,x)$, $M_{\zeta,0}(t,x)$, $M_{\zeta,4}(t,x)$, $M_{\eta,0}(t,x)$, $M_{\eta,4}(t,x)$, $M_{\theta,0}(t,x)$, $M_{\theta,4}(t,x)$ are real, and

$$\gamma^{[5]}:=\begin{bmatrix}1_2 & 0_2\\ 0_2 & -1_2\end{bmatrix}.$$

This equation is a generalization of the Dirac's equation with gauge fields $\Theta_k(t,x)$ and $\Upsilon_k(t,x)$ and with eight mass members. The mass members with elements of the light pentad (M_0 and M_4) conform to neutrino and its' lepton states [8, pp.110--142]. And six mass members with elements of chromatic pentads conform to three pairs (up and down) of chromatic states (red, green, blue) [8, pp.145—159].

3. Masses and Equation of Lepton's Moving

I call the following part of equation (3)

$$\left(\sum_{\nu=0}^{3}\beta^{[\nu]}\left(\partial_\nu+\mathrm{i}\Theta_\nu+\mathrm{i}\Upsilon_\nu\gamma^{[5]}\right)+\left(\mathrm{i}M_0\gamma^{[0]}+\mathrm{i}M_4\beta^{[4]}\right)\right)\varphi=0 \quad (4)$$

the equation of lepton's moving.

Let

$$u_{A,\nu}:=\mathrm{c}\frac{j_{A,\nu}}{\rho_A}, u_{A,4}:=\mathrm{c}\frac{\varphi^\dagger\beta^{[4]}\varphi}{\rho_A}, u_{A,5}:=\mathrm{c}\frac{\varphi^\dagger\gamma^{[0]}\varphi}{\rho_A}.$$

In that case:

$$\sum_{k=1}^{5}u_{A,k}^2=\mathrm{c}^2.$$

Thus, only all five elements of a Clifford pentad provide an entire set of speed components and, for completeness, yet two "space" coordinates x_4 and x_5 should be added to our three x_1, x_2, x_3. These additional coordinates can be selected so that

$$-\frac{\pi\mathrm{c}}{\mathrm{h}}\leq x_4\leq\frac{\pi\mathrm{c}}{\mathrm{h}}, -\frac{\pi\mathrm{c}}{\mathrm{h}}\leq x_5\leq\frac{\pi\mathrm{c}}{\mathrm{h}}.$$

Coordinates x_4 and x_5 are not coordinates of any events. Hence, our devices do not detect them as actual space coordinates.

Denote:

$$\tilde\varphi(t,x_1,x_2,x_3,x_4,x_5)$$
$$:=\varphi(t,x_1,x_2,x_3)\exp\Big(\mathrm{i}\big(x_5M_0(t,x_1,x_2,x_3)$$
$$+x_4M_4(t,x_1,x_2,x_3)\big)\Big).$$

In that case equation (4) has the following shape:

$$\left(\sum_{\nu=0}^{3}\beta^{[\nu]}\left(\mathrm{i}\partial_\nu+\Theta_\nu+\Upsilon_\nu\gamma^{[5]}\right)-\left(\mathrm{i}\gamma^{[0]}\partial_5+\mathrm{i}\beta^{[4]}\partial_4\right)\tilde\varphi=0 \right. (5)$$

Because the following system of equations with unknown functions B_k and F_k

$$\begin{cases}0.5g_1B_k-F_k=-\Theta_k-\Upsilon_k,\\ g_1B_k-F_k=-\Theta_k+\Upsilon_k\end{cases}$$

has solution for any k and for some constant real positive number $g_1$the equation (5) has got the following form:

$$\left(\sum_{\mathrm{k}=0}^{3}\beta^{[k]}\left(\mathrm{i}\partial_k+F_k+0.5g_1YB_k\right)-\left(\mathrm{i}\gamma^{[0]}\partial_5+\mathrm{i}\beta 4\partial 4\,\varphi=0\right.\right. \qquad (6)$$

here

$$Y:=-\begin{bmatrix}1_2 & 0_2\\ 0_2 & -2\cdot 1_2\end{bmatrix}.$$

Let

$$N_\vartheta:=\mathrm{trunk}\left(\frac{\mathrm{c}}{\mathrm{h}}M_0\right), N_\omega:=\mathrm{trunk}\left(\frac{\mathrm{c}}{\mathrm{h}}M_4\right).$$

In this case Fourier series for $\tilde\varphi$is of the following form:

$$\tilde\varphi(t,\mathbf{x},x_4,x_5)=\varphi(t,\mathbf{x})\sum_{n,s}\delta_{-n,N_\vartheta(t,\mathbf{x})}\,\delta_{-s,N_\omega(t,\mathbf{x})}\cdot$$
$$\exp\left(-\mathrm{i}\frac{\mathrm{h}}{\mathrm{c}}(nx_5+sx_4)\right) \qquad (7)$$

From properties of δ : in every point $\langle t;\ x\rangle$: either $\tilde\varphi(t,x,x_4,x_5)=0$ or integer numbers n_0 and s_0 exist for which:

$$\tilde\varphi(t,x,x_4,x_5)=\varphi(t,x)\exp\left(-\mathrm{i}\frac{\mathrm{h}}{\mathrm{c}}(n_0x_5+s_0x_4)\right)$$

And equation (6) has the following form:

$$\left(\sum_{\mathrm{k}=0}^{3}\beta^{[k]}\left(\mathrm{i}\partial_k+F_k+0.5g_1YB_k\right)--\frac{\mathrm{h}}{\mathrm{c}}\left(\gamma^{[0]}n_0+\right.\right.$$
$$\left.\left.\beta^{[4]}s_0\right)\right)\tilde\varphi=0 \qquad (8)$$

For each weak isospin transformation $U^{(-)}$ [8, p.110] operators ℓ and ℓ_{*} and a real number a exist such that:

$$U^{(-)\dagger}\gamma^{[0]}U^{(-)} = a\gamma^{[0]} - (\ell - \ell_{*})\sqrt{(1-a^2)}\beta^{[4]},$$
$$U^{(-)\dagger}\beta^{[4]}U^{(-)} = a\beta^{[4]} + (\ell - \ell_{*})\sqrt{(1-a^2)}\gamma^{[0]}$$

and, hence,

$$U^{(-)\dagger}\left(\gamma^{[0]}n_0 + \beta^{[4]}s_0\right)U^{(-)} = \left(an_0 + (\ell - \ell_{*})\sqrt{(1-a^2)}a_0\right)\gamma^{[0]}$$

$$+\left(as_0 - (\ell - \ell_{*})\sqrt{(1-a^2)}\right)\beta^{[4]}.$$

Wherein:

$$\left(an_0 + (\ell - \ell_{*})\sqrt{(1-a^2)}a_0\right)^2 + \left(as_0 - (\ell - \ell_{*} 1-a23=n02+s02. \quad (9)$$

Let $N_{\omega}(t,\mathrm{x}) = 0$ and $N_{\vartheta}(t,\mathrm{x}) = n_0$. In that case:

$$\tilde{\varphi}(t,\mathrm{x},x_4,x_5) = \varphi(t,\mathrm{x})\exp\left(-\mathrm{i}\frac{\mathrm{h}}{\mathrm{c}}n_0x_5\right).$$

Here if

$$m_0 := \sqrt{(n_0^2 + s_0^2)}$$

And

$$m := \frac{\mathrm{h}^2}{\mathrm{c}^2}m_0$$

then$m$ is denoted *mass* of A.

That is for every space-time point: either this point is empty or single mass is placed in this point.

And this mass is invariant under weak isospin transformation $U^{(-)}$.

4. Electroweak Equations

Let us consider the space $\mathfrak{I}_e$spanned of the following basis [8, p.111]:

$$\mathfrak{I}_{e,v} := $$
$$:= \begin{cases} \frac{\mathrm{h}}{2\pi\mathrm{c}}\sqrt{\frac{2\pi n_0}{\sinh(2\pi n_0)}}\left(\cosh\left(\frac{\mathrm{h}}{\mathrm{c}}n_0x_4\right) + \sinh\left(\frac{\mathrm{h}}{\mathrm{c}}n_0x_4\right)\right)\varepsilon_k, \\ \frac{\mathrm{h}}{2\pi\mathrm{c}}\exp\left(-\mathrm{i}\frac{\mathrm{h}}{\mathrm{c}}n_0x_5\right)\varepsilon_k \end{cases}$$

With some integer n_0.

In this space equation (6) is equivalent to the following [8, p.141]:

$$\sum_{k=0}^{3}\beta^{[k]}\left(\mathrm{i}\partial_k + e\hat{A}_k + 0.5\left(\hat{Z}_k + \widehat{W}_k\right)\right)\tilde{\varphi} - \left(\mathrm{i}\gamma^{[0]}\partial_5 + \mathrm{i}\beta^{[4]}\partial_4\right)\tilde{\varphi} = 0$$

where:

$$\tilde{\varphi} := \begin{bmatrix} \varphi_{\nu,1} \\ \varphi_{\nu,2} \\ 0 \\ 0 \\ \varphi_{e,L,1} \\ \varphi_{e,L,2} \\ \varphi_{e,R,1} \\ \varphi_{e,R,2} \end{bmatrix}, \hat{A}_k := A_k\begin{bmatrix} 0_2 & 0_2 & 0_2 & 0_2 \\ 0_2 & 1_2 & 0_2 & 0_2 \\ 0_2 & 0_2 & 1_2 & 0_2 \\ 0_2 & 0_2 & 0_2 & 1_2 \end{bmatrix},$$

$$\hat{Z}_k :=:= Z_k\begin{bmatrix} (g_1^2+g_2^2)1_2 & 0_2 & 0_2 & 0_2 \\ 0_2 & 2g_1^2 1_2 & 0_2 & 0_2 \\ 0_2 & 0_2 & (g_1^2-g_2^2)1_2 & 0_2 \\ 0_2 & 0_2 & 0_2 & 2g_1^2 1_2 \end{bmatrix}$$

$$\widehat{W}_k :=$$
$$:= g_2\begin{bmatrix} 0_2 & 0_2 & (W_{1,k} - \mathrm{i}W_{2,k})1_2 & 0_2 \\ 0_2 & 0_2 & 0_2 & 0_2 \\ (W_{1,k} + \mathrm{i}W_{2,k})1_2 & 0_2 & 0_2 & 0_2 \\ 0_2 & 0_2 & 0_2 & 0_2 \end{bmatrix}$$

here: A_k, Z_kW_k are real functions, g_1, g_2 are real positive constants,

$$e := \frac{g_1g_2}{\sqrt{(g_1^2 + g_2^2)}}.$$

The vector field $\hat{A}_k$ is the electromagnetic potential and $\left(\hat{Z}_k + \widehat{W}_k\right)$ is the weak interaction potential.

It is proven [8, pp.132—133] W bosons obey the follow equation:

$$\partial_{\mu}W_{\nu} - \partial_{\nu}W_{\mu} = \mathrm{i}\frac{g_2}{2}\left(W_{\mu}W_{\nu} - W_{\nu}W_{\mu}\right).$$

The following systemis obtained from the equation:

$$\begin{cases} \partial_{\nu}W_{0,\mu} = \partial_{\mu}W_{0,\nu} - g_2\left(W_{1,\mu}W_{2,\nu} - W_{1,\nu}W_{2,\mu}\right), \\ \partial_{\nu}W_{1,\mu} = \partial_{\mu}W_{1,\nu} - g_2\left(W_{2,\mu}W_{0,\nu} - W_{2,\nu}W_{0,\mu}\right), \\ \partial_{\nu}W_{2,\mu} = \partial_{\mu}W_{2,\nu} - g_2\left(W_{0,\mu}W_{1,\nu} - W_{0,\nu}W_{1,\mu}\right). \end{cases}$$

This system has the following solutions for every field $W_{k\mu}$[8, p.137--139]:

$$\left(-\tfrac{1}{\mathrm{c}}\partial_t^2 + \textstyle\sum_{s=1}^{3}\partial_s^2\right)W_{k,\mu} = g_2^2\left(\widetilde{W}_0^2 - \textstyle\sum_{s=1}^{3}\widetilde{W}_s^2\right)W_{k,\mu} + \Lambda \quad (10)$$

here:

$$\widetilde{W}_{\nu} := \begin{bmatrix} W_{0,\nu} \\ W_{1,\nu} \\ W_{2,\nu} \end{bmatrix}$$

with

$$W_{0,\nu} := Z_\nu \frac{g_2}{\sqrt{(g_1^2 + g_2^2)}} + A_\nu \frac{g_1}{\sqrt{(g_1^2 + g_2^2)}}$$

and Λ is the action of other components of field W on $W_{k,\mu}$.

Equation (10) looks like the Klein-Gordon equation of field $W_{k,\mu}$with mass

$$m = \frac{h}{c} g_2 \sqrt{\left(\widetilde{W}_0^2 - \sum_{s=1}^{3} \widetilde{W}_s^2\right)}$$

and with additional terms of the $W_{k,\mu}$interactions with other componentsof W.

This "mass" is invariant under Lorentz transformations:

$$\widetilde{W}_0 \to \widetilde{W}_0' := \frac{\widetilde{W}_0 - \frac{v}{c}\widetilde{W}_k}{\sqrt{\left(1 - \left(\frac{v}{c}\right)^2\right)}},$$

$$\widetilde{W}_k \to \widetilde{W}_k' := \frac{\widetilde{W}_k - \frac{v}{c}\widetilde{W}_0}{\sqrt{\left(1 - \left(\frac{v}{c}\right)^2\right)}},$$

$$\widetilde{W}_j \to \widetilde{W}_j' := \widetilde{W}_j \text{ if } j \neq k,$$

is invariant under turns of the$\left(\widetilde{W}_1, \widetilde{W}_2, \widetilde{W}_3\right)$ space:

$$\begin{cases} \widetilde{W}_k \to \widetilde{W}_k' := \widetilde{W}_k \cos\lambda - \widetilde{W}_s \sin\lambda, \\ \widetilde{W}_s \to \widetilde{W}_s' := \widetilde{W}_s \cos\lambda + \widetilde{W}_k \sin\lambda, \end{cases}$$

and invariant under a global weak isospin transformation $U^{(-)}$[8, p.138]:

$$\widetilde{W}_\nu \to \widetilde{W}_\nu' := U^{(-)} \widetilde{W}_\nu U^{(-)\dagger},$$

but is not invariant for a local transformation $U^{(-)}$. But local transformations for $W_{0,\nu}$, $W_{1,\nu}$, $W_{2,\nu}$ are insignificant since all three particles are very short-lived and a measurement of masses of these particles is practically possible only at the point ($t \approx 0$; x ≈ 0).

If

$$\alpha := \tan^{-1} \frac{g_1}{g_2}$$

then masses of Z and W fulfil the following ratio:

$$m_W = \frac{m_Z}{\cos\alpha}.$$

Therefore, the Glashow's electroweak theory without higgs is deduced from properties of physics events probabilities.

5. Chromatic States and Gluons

The following part of (3) I call chromatic movement equation:

$$\left(\sum_{\nu=0}^{3} \beta^{[\nu]} \left(\partial_\nu + i\Theta_\nu + i\Upsilon_\nu \gamma^{[5]}\right) - iM_{\zeta,0}\gamma_\zeta^{[0]} + iM_{\zeta,4}\zeta^{[4]}\right.$$
$$\left.- iM_{\eta,0}\gamma_\eta^{[0]} + iM_{\eta,4}\eta^{[4]} + iM_{\theta,0}\gamma_\theta^{[0]} + iM_{\theta,4}\theta^{[4]}\right)\varphi = 0 \quad (11)$$

Here [8, p.60]:

$$\gamma_\zeta^0 := -\begin{bmatrix} 0_2 & \sigma_1 \\ \sigma_1 & 0_2 \end{bmatrix}, \zeta^4 := \mathrm{i}\begin{bmatrix} 0_2 & \sigma_1 \\ -\sigma_1 & 0_2 \end{bmatrix}$$

are mass elements of red pentad;

$$\gamma_\eta^0 := -\begin{bmatrix} 0_2 & \sigma_2 \\ \sigma_2 & 0_2 \end{bmatrix}, \eta^4 := \mathrm{i}\begin{bmatrix} 0_2 & \sigma_2 \\ -\sigma_2 & 0_2 \end{bmatrix}$$

are mass elements of green pentad;

$$\gamma_\theta^0 := -\begin{bmatrix} 0_2 & \sigma_3 \\ \sigma_3 & 0_2 \end{bmatrix}, \theta^4 := \mathrm{i}\begin{bmatrix} 0_2 & \sigma_3 \\ -\sigma_3 & 0_2 \end{bmatrix}$$

are mass elements of blue pentad.

I call;

- $M_{\zeta,0}$, $M_{\zeta,4}$ are red lower and upper mass members;
- $M_{\eta,0}$, $M_{\eta,4}$ are green lower and upper mass members;
- $M_{\theta,0}$, $M_{\theta,4}$ are blue lower and upper mass members.

The mass members of this equation form the following matrix sum:

$$\widehat{M} := -iM_{\zeta,0}\gamma_\zeta^{[0]} + iM_{\zeta,4}\zeta^{[4]} - iM_{\eta,0}\gamma_\eta^{[0]} + iM_{\eta,4}\eta^{[4]}$$
$$+ iM_{\theta,0}\gamma_\theta^{[0]} + iM_{,\theta,4}\,\theta^{[4]} =$$
$$= \begin{bmatrix} 0 & 0 & -M_{\theta,0} & M_{\zeta,\eta,0} \\ 0 & 0 & {M_{\zeta,\eta,0}}^* & M_{\theta,0} \\ -M_{\theta,0} & M_{\zeta,\eta,0} & 0 & 0 \\ {M_{\zeta,\eta,0}}^* & M_{\theta,0} & 0 & 0 \end{bmatrix} +$$
$$+ \begin{bmatrix} 0 & 0 & M_{\theta,4} & {M_{\zeta,\eta,4}}^* \\ 0 & 0 & M_{\zeta,\eta,4} & -M_{\theta,4} \\ -M_{\theta,4} & -{M_{\zeta,\eta,4}}^* & 0 & 0 \\ -M_{\zeta,\eta,4} & M_{\theta,4} & 0 & 0 \end{bmatrix}$$

With $M_{\zeta,\eta,0} := M_{\zeta,0} - \mathrm{i}M_{\eta,0}$ and $M_{\zeta,\eta,4} := M_{\zeta,4} - \mathrm{i}M_{\eta,4}$.

Elements of these matrices can be rotated by the following octet elements [8, pp.147--157]:

$$\acute{U} := \{U_{1,2}(\alpha), U_{1,2}(\alpha), U_{1,2}(\alpha),$$
$$U_{1,2}(\alpha), U_{1,2}(\alpha), U_{1,2}(\alpha), \widetilde{U}(\alpha), \widehat{U}(\alpha)\}$$

where $\alpha := \alpha(t,\mathrm{x})$ is any real function.

For example, if

$$\widehat{M}' := U_{2,3}^{-1}(\alpha)\widehat{M}U_{2,3}(\alpha) =$$

$$-\mathrm{i}M'_{\zeta,0}\gamma_{\zeta}^{[0]} + \mathrm{i}M'_{\zeta,4}\zeta^{[4]} -$$

$$-\mathrm{i}M'_{\eta,0}\gamma_{\eta}^{[0]} + \mathrm{i}M'_{\eta,4}\eta^{[4]} +$$

$$+\mathrm{i}M'_{\theta,0}\gamma_{\theta}^{[0]} + \mathrm{i}M'_{\theta,4}\theta^{[4]}$$

then

$$M'_{\zeta,0} = M_{\zeta,0},$$
$$M'_{\eta,0} = M_{\eta,0}\cos 2\alpha + M_{\theta,0}\sin 2\alpha,$$
$$M'_{\theta,0} = M_{\theta,0}\cos 2\alpha - M_{\eta,0}\sin 2\alpha\,,$$

$$M'_{\zeta,4} = M_{\zeta,4},$$
$$M'_{\eta,4} = M_{\eta,4}\cos 2\alpha + M_{\theta,4}\sin 2\alpha,$$
$$M'_{\theta,4} = M_{\theta,4}\cos 2\alpha - M_{\eta,4}\sin 2\alpha\,.$$

Therefore, matrix $U_{2,3}(\alpha)$ makes an oscillation between green and blue chromes. And this transformation of equation (11) bends time-space as the following:

$$\frac{\partial}{\partial x_2{}'} := \cos 2\alpha\frac{\partial}{\partial x_2} - \sin 2\alpha\frac{\partial}{\partial x_3},$$
$$\frac{\partial}{\partial x_3{}'} := \cos 2\alpha\frac{\partial}{\partial x_3} + \sin 2\alpha\frac{\partial}{\partial x_2}. \tag{12}$$

One more example: if

$$\widehat{M}' := U_{0,1}^{-1}(\alpha)\widehat{M}U_{0,1}(\alpha) = -\mathrm{i}M'_{\zeta,0}\gamma_{\zeta}^{[0]} + \mathrm{i}M'_{\zeta,4}\zeta^{[4]}$$

$$-\mathrm{i}M'_{\eta,0}\gamma_{\eta}^{[0]} + \mathrm{i}M'_{\eta,4}\eta^{[4]} + \mathrm{i}M'_{\theta,0}\gamma_{\theta}^{[0]} + \mathrm{i}M'_{\theta,4}\theta^{[4]}$$

then

$$M'_{\zeta,0} = M_{\zeta,0},$$
$$M'_{\eta,0} = M_{\eta,0}\cosh 2\alpha + M_{\theta,0}\sinh 2\alpha,$$
$$M'_{\theta,0} = M_{\theta,0}\cosh 2\alpha - M_{\eta,0}\sinh 2\alpha\,,$$

$$M'_{\zeta,4} = M_{\zeta,4},$$
$$M'_{\eta,4} = M_{\eta,4}\cosh 2\alpha + M_{\theta,4}\sinh 2\alpha,$$
$$M'_{\theta,4} = M_{\theta,4}\cosh 2\alpha - M_{\eta,4}\sinh 2\alpha\,.$$

Therefore, matrix $U_{0,1}(\alpha)$ makes an oscillation between green and blue chromes with oscillation between upper and lower mass members. And this transformation of equation (11) bends time-space as the following:

$$\frac{\partial x_1}{\partial x_1{}'} = \cosh 2\alpha,$$
$$\frac{\partial t}{\partial x_1{}'} = \frac{1}{\mathrm{c}}\sinh 2\alpha, \tag{13}$$
$$\frac{\partial x_1}{\partial t'} = \mathrm{c}\sinh 2\alpha,$$

$$\frac{\partial t}{\partial t'} = \cosh 2\alpha\,,$$
$$\frac{\partial x_2}{\partial t'} = \frac{\partial x_3}{\partial t'} = \frac{\partial x_2}{\partial x_1{}'} = \frac{\partial x_3}{\partial x_1{}'} = 0.$$

Therefore, the oscillation between blue and green colours with the oscillation between upper and lower mass members bends the space in the t, x_1 directions.

Such transformation with elements of set U add to equation (11) gauge fields of the following shape:

$$U_k^{-1}(\alpha)\partial_s U_k(\alpha),$$

where $U_k(\alpha) \in \acute{U}$. And for every element $U_k(\alpha)$ of $\acute{U}$ exists [8, pp.155--157] matrix Λ_k such that

$$U_k^{-1}(\alpha)\partial_s U_k(\alpha) = \Lambda_k \partial_s \alpha$$

and for every product U of $\acute{U}$'s elements real functions $G_s^r(t;\mathbf{x})$exist suchthat

$$U_k^{-1}(\alpha)\partial_s U_k(\alpha) = \frac{g_3}{2}\sum_{r=1}^{8}\Lambda_r\, G_s^r$$

with some real constant g_3 (similar to 8 gluons

6. Newton's Gravity, Confinement, Asymptotic Freedom

From (13):

$$\frac{\partial x_1}{\partial t'} = \mathrm{c}\sinh 2\alpha,$$
$$\frac{\partial t}{\partial t'} = \cosh 2\alpha\,.$$

Because

$$\sinh 2\alpha = \frac{v}{\sqrt{\left(1-\frac{v^2}{\mathrm{c}^2}\right)}},$$
$$\cosh 2\alpha = \frac{1}{\sqrt{\left(1-\frac{v^2}{\mathrm{c}^2}\right)}}$$

where v is the velocity of system $\{t', x_1'\}$as respects system $\{t, x_1\}$ then $v = c \tanh 2\alpha$.

Let

$$2\alpha := \omega(\mathrm{x}_1)\frac{\mathrm{t}}{\mathrm{x}_1}$$

with

$$\omega(\mathrm{x}_1) := \frac{\lambda}{|\mathrm{x}_1|}$$

where λ is a real constant bearing positive numerical value.

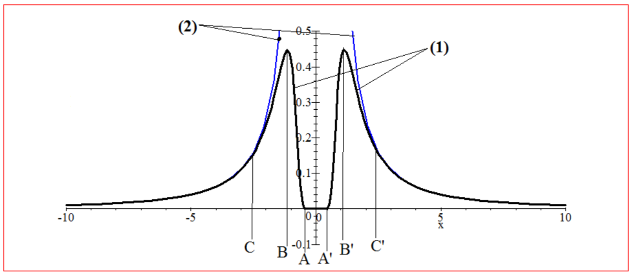
In that case if g is the acceleration of system $\{t', x_1'\}$as respects system $\{t, x_1\}$ then

$$g(t, x_1) = \frac{\partial v}{\partial t} = \frac{\omega(x_1)}{x_1 \cosh^2\left(\omega(x_1)\frac{t}{x_1}\right)}.$$

In 3-dimensional space:

$$g(t, x) = \frac{c\lambda}{\left(x^2 \cosh^2\left(\frac{\lambda t}{x^2}\right)\right)}.$$

Here the acceleration plot is line (1) and the line (2) is plot of λ/x^2:



Acceleration of $\{t', x_1'\}$ in $\{t, x_1\}$.

I call:

- intervals from –∞ to C and from C' to ∞: *Newton Gravity Zone*,
- interval from A to A': *Asymptotic Freedom Zone*,
- intervals from B to A and from A' to B': *Confinement Force Zone*.

7. Conclusions

It is known that Dirac's equation contains four anticommutive complex 4X4 matrices. And this equation is not invariant under electroweak transformations (for instance, [9, p.97]). But it turns out that there is another such matrix anticommutive with all these four matrices [8, p.60].

If additional mass term with this matrix will be added to Dirac's equation then the resulting equation shall be invariant under these transformations [8, pp.105—128]

I call these five of anticommutive complex 4X4 matrices *Clifford pentad*. There exist only six Clifford pentads [8, pp.59—60]. I call one of them *the light pentad*, three - *the chromatic pentads*, and two - *the gustatory pentads*.

The light pentad contains three matrices corresponding to the coordinates of 3-dimensional space, and two matrices relevant to mass terms - one for the lepton and one for the neutrino of this lepton.

Each chromatic pentad also contains three matrices corresponding to three coordinates and two mass matrices - one for top quark and another - for bottom quark.

Each gustatory pentad contains one coordinate matrix and two pairs of mass matrices - these pentads are not needed yet [8, pp. 60].

It is proven [8, pp.60—62] that any 3 + 1 vector of probability density expressed in a 4 × 1 complex matrix function.

It is proven [8, pp.65--68, 81—83] that any square-integrable4x1-matrix function with bounded domain (Planck's function) obeys some generalization of Dirac's equation with additional gauge members. This generalization is the sum of products of the coordinate matrices of the light pentad and covariant derivatives of the corresponding coordinates plus product of all the eight mass matrices (two of light and six of chromatic) and the corresponding mass numbers.

If this equation does not contain chromatic mass numbers then we obtain the Dirac type equation for leptons with gauge members which are similar to electroweak fields obtained for gauge fields *W* and *Z* [8, pp.83--89, 106—141].

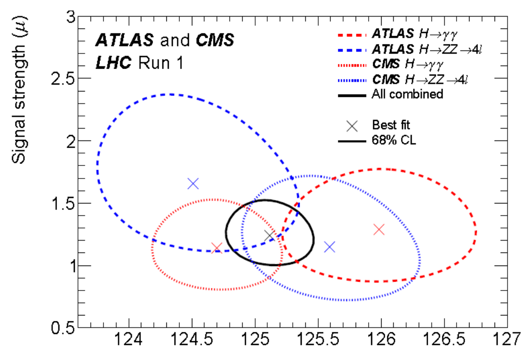
If this equation does not contain lepton's and neutrino's mass terms then we obtain the Dirac type equation with gauge members similar to eight gluon's fields [8, pp.145 –157].

And oscillations of chromatic states of this equation bend space-time. This bend gives rise to the effects of redshift, confinement and asymptotic freedom, and Newtonian gravity turns out to be a continuation of sub nucleonic forces [8, pp.159—16

And it turns out that these oscillations bend space-time so that at large distance space expands with acceleration according to Hubble's law. And these oscillations bend space-time so that here appears the discrepancy between quantity of the luminous matter in space structures and the traditional picture of gravitational interaction of stars in these structures [8, pp.161—167].

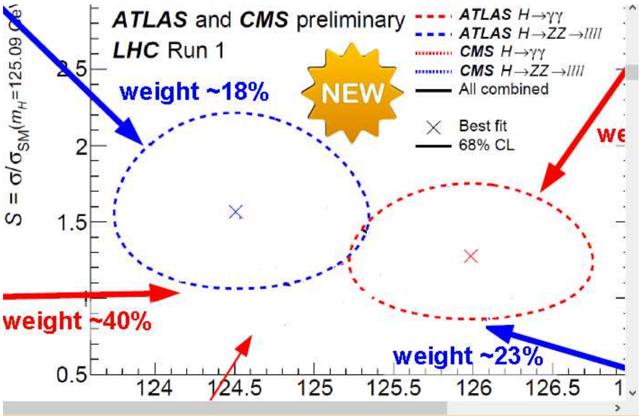
Thus, gravity and all physical phenomena of the experimentally confirmed Standard Model (without higgs) are explained by the probability dot events properties.

And fermion masses are obtained naturally from the Dirac-type equation, and masses of *W* and *Z* bosons emerge dynamically from the equations of motion. Consequently, Higgs is unnecessary

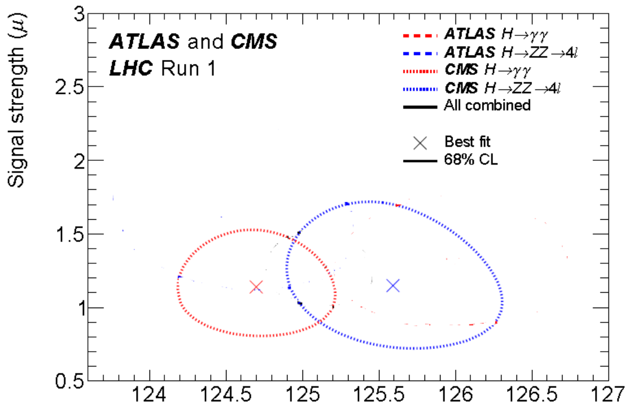


Picture from [10, p.10]

I delete line of CMS:



Pcture without CMS



Picture without ATLAS

Is it higgs? No, it's more like a meson multiplet. Probably so: let q_d and q_u be the quarks. Then ATLAS:

$$q_u\bar{q}_d \rightarrow \gamma\gamma \ 126$$

$$q_d\bar{q}_u \rightarrow ZZ \rightarrow 4l \ 124.5$$

CMS:

$$(q_u\bar{q}_u - q_d\bar{q}_d) \rightarrow \gamma\gamma \ 125$$

$$(q_u\bar{q}_u - q_d\bar{q}_d) \rightarrow ZZ \rightarrow 4l \ 125$$

Therefore, physics does not need to supersymmetry and the Higgs. All elementary bosons are gauge.

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