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Symmetrical Current and Massive Gauge Bosons in Standard Model 4

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This note will be a brief account of an unknown vectorial mathematical current in SM_4 Field based on disintegrating the Lagrangian of quarks in SM4 into four parts. It is shown that the current breaks while interacting with the quarks and makes the quarks to not interact with fourth-generation quarks. This note also shows that gauge bosons are produced while these currents symmetry break and provides the service as mediators.

Keywords Beyond the Standard Model; Gauge Sector

1. INTRODUCTION

Lagrangian of Standard Model Four (SM4) QCD including another pair of quarks at TeV (mass) scales can be divided into,

$$\mathcal{L}_{SM} = \mathcal{L}_{ud} + \mathcal{L}_{cs} + \mathcal{L}_{tb} + \mathcal{L}_{SM4} + \mathcal{L}_{Int} \qquad (1)$$

where $\mathcal{L}_{SM4}$ is the Lagrangian of SM_4 quarks [1].. It was shown in a note by the author that these quarks have heavy mass [2] which breaks the symmetry at Tev Scales. Now if we ignore STU parameters [1] for a second and include the SM_4 in interaction Lagrangian ($\mathcal{L}_{Int}$), the interaction having now a gauge group of $SU(3+\beta)$ [2] is not the same that we have in SM_3 chromodynamics. Where β is a choice of theories, it is different in different models, like SU(5) or SU(10), $\mathcal{L}_{Int}$ have, what the author claims are unknown current that prevents SM_4 particles to interact with the fundamental particles. However this is just vectorial mathematical (not physical) current which is introduced at TeV scales, just to describe abstruse but fragile models in SM4 [3] and Two Higgs Doublet [4].

2. THE CURRENT AND HEAVY BOSON

Though there are not any current scheme in QCD, it is believed that when SM_4 particles interact with current Standard Model particles, it breaks the symmetry that is accompanied by a Goldstone Boson [5], which was predicted by Georgi, Quinn and Weinberg in a unification scheme [6].

The Spontaneous Symmetry breaking can be because of the hierarchy in masses of these yet discovered quarks. It can be concluded that the symmetry in QCD is badly broken when this break and do re-store later because of the Higgs Mechanism contributing the mass to heavy gauge bosons [7].

What these symmetries can be? It may be a current that is globally conserved using the same group mechanism of QCD but mostly found in discrete energies and mainly responsible for providing the no interaction scheme between SM_4 Lagrangian and SM_3 Lagrangian. The interaction between SM_4 and SM

$$\mathcal{L} = \alpha + \zeta \qquad (2)$$

where α is the regular Lagrangian of Higgs Mechanism and ζ is the current that in equation 1 interact with every set of families and making them not interacting with α because of no current in any QCD families. These current ζ is mainly because the large mass of quarks, it is believed that mass of quarks without electroweak corrections can be at few TeV scales [8], [9], which will induce the current that provides the mechanism.

Talking about this current is however not any analogy of weak and neutral currents of Electroweak theory [10], [11]. This current can be a hypothetical Lagrangian for the reason of not finding SM_4 particles [9], because they may not interact with ordinary hadrons. A simple shift providing support for these types of current which provide the symmetry breaking is the pointing of heavy bosons in unified [6] theories and SM_4 is also a part of that theory.

It was also advised during Electroweak building that many currents are unrecognized in the mechanism of the particle, especially those which are responsible for symmetry breaking and providing unknown heavy unknown gauge bosons of 10^7 GeV [6], which makes the perfect coordination between the interaction of these heavy gauge bosons and fourth-generation particles.

ζ is perhaps a modification in interaction scheme provided by a sudden hierarchy in the mass of the third-generation particle and fourth-generation particles, which solves the problem of hierarchy in SM_4 models, hence it can be concluded that mass of TeV scales quarks are possible if they break the symmetry (in this case ζ) and do not interact with the other particles until they have the same origination of such currents. η which is the Goldstone boson by spontaneous symmetry breaking of this

[1] t' and b' are introduced quarks of the fourth generation with lower bounds of 4 TeV and 1.3 TeV. But mostly ruled out by oblique parameters. But have the potential of describing CP Violation using new mechanisms

[2] Yet to be published.

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ζ current. These mechanisms will eventually lead to gauge bosons [12], [5], [6], which I have referred above may become a hindrance for being a mediator of only fourth-generation particles. And may have close connections with W and Z bosons, and with electroweak corrections may lead to a unified theory by being in an indirect connection with A_μ.

Interaction between ζ current and current particles may provide the reason of not observing these particles, as the no interaction scheme is introduced by ζ because its symmetry break while interacting with currents quarks which eventually makes these hadrons to not interact with fourth-generation particles, t' and b'.

3. CONCLUSION

Hence it can be concluded that fourth-generation particles have another gauge boson having mass in contrast with current boson of QCD because of spontaneous symmetry breaking by an unidentified current which is also responsible for no interaction and no observation of fourth-generation particles especially quarks. But I also offer an apology that I didn't provide any insights on what these currents can be.

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