On The Fractional Fundamental Boson

By Deep Jyoti Dutta

* Division of Nuclear Physics (DNP), American Physical Society, College Park, Maryland, United States of America

Abstract

Our vision is to theoretically establish a fractional charged elementary vector boson of spin unity and also an equation to compute the mass of elementary but charged weak gauge boson.

Fabulous theoretical framework explains the particle physics laws and force along with their interactions such model which theorist call as a standard model. Four fundamental forces in which electromagnetic and weak force are previously unified [1] in complete agreement with experiments. We previously predicted a vector boson [2] of charge one- third and now if we explain all vector boson charges in one equation we simply obtain a unified relation in order of

$$\{A' - W^{+} - B' - g^{L} - g^{V} - \gamma - Z^{0}\} = 0$$

To obey simple pattern a vector (spin unity) boson A' of charge must be of fourth- third should exist. Other bosons g^{L}, is the charge of gluon, g^{V} is the charge of graviton, γ charge of photon, B' is the new boson independently predicted by the same author see ref 2 which must possess charge +1/3, Z^{0} charge of z boson. The mechanism that breaks the gauge symmetry in vacuum was earlier proposed [3]. Weinberg's model shows that spin 1 charged weak boson's field is given by

$$W_{\mu} = 2^{-\frac{1}{2}}({A_{\mu}}^{1} + i{A_{\mu}}^{2})$$

The neutral z boson field would be

$$Z_{\mu} = (g^{2} + g'^{2})^{-\frac{1}{2}}(g{A_{\mu}}^{3} + g'B_{\mu})$$

$g\ is\ the\ SU(2)\ gauge\ coupling\ and\ g'\ is\ the\ U(1)\ gauge\ co$

For electromagnetic boson field we have

$$A_{\mu} = (g^{2} + g'^{2})^{-\frac{1}{2}}(-g{A_{\mu}}^{3} + g'B_{\mu})$$

Traditionally w boson mass would be

$$M_{W} = \frac{1}{2}\lambda g$$

Lambda is the vacuum expectation value of Higgs field $\approx 246\ GeV$

Our task requires no need of z boson mass

For photon mass

$$M_{A} = 0$$

Our equation suggest the mass of w boson relating with protons mass and baryon number of quarks with electromagnetic vector boson mass

$$M_{W} = (B\lambda - 2M_{P} - M_{A})$$

This predicted particle according to this theory of electric field must possess decay to certain particles (because up quarks have charge +2/3)

$$A' \rightarrow u + u \ (two\ up\ quark)$$

As in beta positive decay there is also an emission of positron so such case A' should follow

$$A' \rightarrow e^{+} + d' \ (d'\ is\ antidown\ quark)$$

The first decay of the boson to a pair of up quarks will therefore strongly establish the proposed hypothesis.

The only prediction here we draw is the prediction of spin one vector boson of possible fractional charge. Collider experiments are suggested to test our theory.

References

[1] Phys. Rev. Lett. **19**, 1264 – Published 20 November 1967

[2] http://vixra.org/pdf/1809.0328v1.pdf

[3] Phys. Rev. Lett. **13**, 508 – Published 19 October 1964