Still Further Improvement of the Accuracy of HCE8S Theory: the Neutron and Z Boson Masses and More

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Abstract: The HCE8S Theory accuracy of the neutron, proton, Z boson and other particle masses has been further improved.

In my last note[1] for HCE8S universe theory, I used the Z(4430) tetraquark/$(1.0221480)^2$ =4430/1.0447865= 4240.1007/15.5 tau neutrino = 273.55488 for the very useful dimensionless constant that I then used to calculate the mass of the d_n and u_n and then the neutron itself. Taking new values for the quark constituents of 3.55220 as the mass of the d_n quark and 2.29120 as the mass of the u_p quark, one gets 939.560 for the mass of the neutron. This is now only 5 low in the 6th place versus the latest[2] measured mass of 939.56541.

This more accurate value for the mass of the neutron requires a slightly different dimensionless constant of 273.55440. This in turn requires a small change in the age of the universe, from 13.799 billion years to 13.799008 By. For 13.799008/13.5 = 1.0221487 and this number squared = 1.0447879. Now 4430/15.5/1.0447879 = 273.55451. Now the ratio of these two numbers is 1.0000004. They agree to 6 digits, which indicates that the neutron and its constituent quarks were all born in our 8th cyclic universe.

Note that TF was active when the neutron and its constituent quarks came into existence (E8 symmetry was broken), so 4-digit mass simplication cannot be used for u_n,d_n quarks as it can for most of the other quarks. This also means that the 5 other 4-digit-or-less quarks were born in the 7 prior

cyclic universes. The case of the top quark is at present uncertain.

Contiuing the quest for accuracy, we have not yet considered the consequences of the ratio of the tauon neutrino mass/muon neutrino mass = 15.5/0.17 = 91.17647. The Z weak boson is measured to be 91.1876, which is close. However for 91.18 (4 digits only), the ratio is 1.0000387 which is more accurate, so 91.18 for the Z boson must be assumed correct.

With the slightly smaller Z boson, and H assumed correct at 125 GeV the QU would be correct at 33.82 GeV. For the muon lepton measuring 105.658366 MeV x 32 = 33.810675 (33.81 four digits) GeV for the QU however, H must be 124.99 GeV. This now 5-digit value for H is greater than 4 digits, indicating an origin for H in the 8th cyclic universe.

Continuing with the muon lepton; 33.81/32 = 105.65625: now 5 digits of this number compared to 5 digits of the 105.658366 best value is the same Since no exotic multiplier enters the calculation we must assume the muon lepton is entirely a product of the present broken symmetry, TF type symmetry.

Next we have the b bottom quark. Its assumed correct 4-digit value is 4.180 GeV. Now 33.81/8 = 4.22625, and this number divided by the exotic number (see before) 13.799008/13.5 = 1.0221487 and $(1.0221487)^{1/2}$ = 1.0110136 and 4.22625/1.0110136 = 4.1802108. Now 4 digits of this number is indeed 4.180.

1. George R. Briggs,"The Z(4430) tetraquark acts like a heavy Majorana neutrino having no electric charge", Vivra 1807.0282, (2018).

2. "Neutron", Wikipedia, (2018)