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1.0 Abstract

What happens deeper than quantum mechanics? Perhaps deeper quantum mechanics with the same laws. The following paper shows how a possible resonance of Cherenkov Radiation with the ratio of Bremsstrahlung-Parallel Bremsstrahlung under special circumstances with processes that are like the Bohr model of the hydrogen atom could give the mass ratio of the electron to the neutron. It would suggest that all of the activity within the nucleons are powered by a main power driver and that quarks are far from fundamental. When a charged particle travels faster than light it emits Cherenkov radiation.

An equation is developed below that uses the coupling dependence and Cherenkov radiation angles summing the radiation angles from $\frac{pi}{2}$ to $\frac{-pi}{2}$ angles and integrating through what may appear to be multiple levels of dimensions. This equation then uses a component of Bremsstrahlung radiation and proposes that there may be some relationship to both Bremsstrahlung, Cherenkov type radiation, and an orbital type model at a deeper than the nucleons that causes some type of resonance that stabilizes the masses of the fundamental particles. This resonance is demonstrated for a rough idea for the electron.

2.0 Equations

The equation for the mass ratio of the electron to the neutron is in three parts. We will describe the energy levels for an orbital type component, we will describe the Cherenkov type component, then the Bremsstrahlung component and then we will be put all together.

2.1 Energy levels

The Energy levels for the Bohr hydrogen atom is as follows.

$\frac{1}{\lambda_x} = R_\infty(\frac{1}{n_1^2} - \frac{1}{n_2^2})$ where $R_\infty = \frac{m_e q^4}{8\epsilon_0^2 h^3 c}$ and where n_1 and n_2 are any two different positive integers (1, 2, 3, ...), and λ is the wavelength (in vacuum) of the emitted or absorbed light.

We will called λ_e for the electron and λ_n for the neutron. It is not possible to measure these levels, but we can see if these wavelengths follow a pattern for the masses of particles.

It is proposed that the ratio of the mass of the electron to the neutron, and of course other particles is related to the ratio the energy levels of a similar process to the Bohr hydrogen, but at a deeper level. It is not expected that R_∞ is not the same number for this deeper level, but this number does not need to be known since we will be taking

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rations of the wavelengths and the R_∞ ratio will become one. For the electron the following equation is proposed.

$$\frac{\lambda_n}{\lambda_e} = \frac{R_\infty(\frac{1}{n_{1e}^2} - \frac{1}{n_{2e}^2})}{R_\infty(\frac{1}{n_{1n}^2} - \frac{1}{n_{2n}^2})} \qquad [1]$$

The following values are substituted in. $n_{1e} = 3$, $n_{2e} = 9$, $n_{1n} = 1$, $n_{2n} = 2$ which yields

$$\frac{\lambda_n}{\lambda_e} = \frac{R_\infty(\frac{1}{3^2} - \frac{1}{9^2})}{R_\infty(\frac{1}{1^2} - \frac{1}{2^2})} = \frac{32}{243} \qquad [2]$$

Whatever the value of , R_∞ , at the next level of dimensions, it cancels with the ratio in equation 2

2.2 Cherenkov Radiation

In an MIT course the Cherenkov radiation satisfied both a resonance and dispersion relation (3)

This is the following equation in their analysis.

$$Cos\theta = \frac{1}{\nu\beta} \qquad [3]$$

Where θ is the possible emission solution angles, ν is relative permittivity, and β is velocity divided by the speed of light. If $\nu = 1$, which is a possibility inside the nucleons.

$$Cos\theta = \frac{1}{\beta} \qquad [4]$$

Note: In this case the velocity is greater than the speed of light. This is true of Cherenkov radiation.

If we look at the following google book (2) and equation 232 we find that θ must be divided by two to keep the sum of the angular momentums equal. Therefore we have

$$\frac{Cos\theta}{2} = \text{ Possible emission solution angles.} \qquad [5]$$

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If we integrate the possible emission solution angles $\frac{Cos\theta}{2}$ from $\frac{\pi}{2}$ to $\frac{-\pi}{2}$ but do this as the Cherenkov type radiation of the nucleons goes through 9 physical dimensions we than have the following equation.

$$\int_{pi/2}^{-pi/2} (\frac{Cos\theta}{2})^9 d\theta \qquad [6]$$

If we set equation 6 equal to $-\frac{2p(1-p)}{\sqrt{3}}$ we obtain the following

$$\frac{-2p(1-p)}{\sqrt{3}} = \int_{pi/2}^{-pi/2} (\frac{Cos\theta}{2})^9 d\theta \qquad [7]$$

And if we substitute p as follows, we get

$$p = \beta^2 = \frac{v^2}{c^2} \qquad [8]$$

We can substitute equation 6 into equation 5 and obtain the following.

$$\frac{-2\beta^2(1-\beta^2)}{\sqrt{3}} = \int_{pi/2}^{-pi/2} (\frac{Cos\theta}{2})^9 d\theta \qquad [9]$$

Or

$$\frac{-2\frac{v^2}{c^2}(1-\frac{v^2}{c^2})}{\sqrt{3}} = \int_{pi/2}^{-pi/2} (\frac{Cos\theta}{2})^9 d\theta\,. \qquad [10]$$

It is not known why setting equation [5] should be set equal to $\frac{-2p(1-p)}{\sqrt{3}}$. The value of $\frac{2}{\sqrt{3}}$ could be due to the Cherenkov nucleon type radiation going through a cuboctahedron angles of 60 degrees or the summing of 3 equal spins in the x, y, and z direction like the intrinsic angular momentum of the electron.

2.3 Bremsstrahlung

How do we obtain the relationship of $p(1-p)$

Let's propose that the value p is a ratio. Here we show that p may be the ratio of the mass of the proton to the neutron. Let's propose that this ratio may come about by calculating the ratio of the Bremsstrahlung type radiation of the Proton to the Neutron. It is called Bremsstrahlung type radiation since it would be a radiation of photons that are absorbed back into the nucleons which would actually not get emitted outside of the nucleons. If we look at the most established for Bremsstrahlung Radiation, we have the following.

$$P = \frac{q^2\gamma^6}{6\pi\grave{o}c}(\dot{\beta}^2 * (1-\beta^2) - (\vec{\beta}\times\dot{\vec{\beta}})^2) \qquad [11]$$

If we look at the case where the acceleration is parallel with the velocity, then

$$P_{parallel} = \frac{q^2\gamma^6}{6\pi\grave{o}c}\dot{\beta}^2_{parallel} \qquad [11.1]$$

When we divide Equation 11 by Equation 11.1 we obtain

$$\frac{P}{P_{parallel}} = \frac{\dot{\beta}^2 * (1-\beta^2) - (\vec{\beta}\times\dot{\vec{\beta}})^2}{\dot{\beta}^2_{parallel}} \qquad [11.2]$$

Lets propose that this equation contains some special situations.

1) For $\dot{\beta}^2$ is equal to $-\beta^2$ for exponential deceleration.
2) $\dot{\beta}^2_{parallel}$ is constant and is equal to $\frac{\sqrt{3}}{2}$
3) $(\vec{\beta}\times\dot{\vec{\beta}}) = \frac{1}{3^4 2}(1-\frac{M_p}{M_n})$

We can then set this equal to the Cherenkov Radiation through 9 dimensions as proposed below.

2.4 Putting it all together.

We can then change the equation 7

$$\frac{-2p(1-p)}{\sqrt{3}} = \int_{pi/2}^{-pi/2}(\frac{Cos\theta}{2})^9 d\theta \qquad [7]$$

to

$$\frac{2}{\sqrt{3}}(-\beta^2(1-\beta^2) - (\frac{(1-\frac{M_p}{M_n})}{3^4 2})^2) = \frac{\lambda_n}{\lambda_e}\int_{pi/2}^{-pi/2}(\frac{Cos\theta}{2})^9 d\theta \qquad [12]$$

$$\frac{2}{\sqrt{3}}(-\beta^2(1-\beta^2) - (\frac{(1-\frac{M_p}{M_n})}{3^4 2})^2) = \frac{32}{243}\int_{pi/2}^{-pi/2}(\frac{Cos\theta}{2})^9 d\theta \qquad [12.1]$$

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$$\frac{M_p}{M_n}((-\beta^2(1-\beta^2)-(\frac{(1-\frac{M_p}{M_n})}{3^4 2})^2)=\frac{8}{\frac{9}{3^2}}\int_{pi/2}^{-pi/2}(\frac{Cos\theta}{2})^9 d\theta \qquad [12.2]$$

This technique hints that the electron may be made of 6 components, directly related to the ratio of the mass of the proton over the mass of the neutron and in a toroid type shape. Perhaps 6 spheres connected in a circle. Therefore it may be necessary to divide the right side of equation 12.1 by 6 to become 12.2 and simplifying to become equation 12.2

Solving equation 12.2 for β^2 yields two results which are summarized below

$\mathrm{B}_{e1}^2 = 0.0000906445574595498$

$\mathrm{B}_{e1}^2 = 0.999909355442540$

Multiplying $\mathrm{B}_{e1}^2 = 0.0000906445574595498$ by 6 yields

$5.4386734475*10^{-4}$ which is within two sigma of the 2014 Codata value shown below.

electron-neutron mass ratio m_e/m_n	
Value	5.438 673 4428 x 10^{-4}
Standard uncertainty	0.000 000 0027 x 10^{-4}
Relative standard uncertainty	4.9 x 10^{-10}
Concise form	5.438 673 4428(27) x 10^{-4}

3 Discussion

This form of equation 12.2 gives a basic form of an equation that may approximate the ratios of the masses of particles. More data and pattern seeking are necessary to confirm the equation 12.2

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References

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