1.0 Abstract

When a particle travels faster than light it emits Cherenkov radiation. When a charged particle is accelerated it emits radiation called bremsstrahlung radiation. Inside a proton are the many configurations of the nucleons. It is proposed here, and likely proposed by others that there may be some equivalent process that there is a constant acceleration that causes the mass of the proton or other particles.
In the case of the mass ratio of the proton to the neutron, the possible equation was found first. This paper is an attempt of an explanation and derivation for the equation that very closely, within the known Codata 2014 mass ratio of the proton to the neutron, gives the mass ratio of the proton to the neutron. An equation is developed below that uses the coupling dependence and radiation angles summing the radiation angles from 0 to $\frac{pi}{2}$ angles and integrating through what may appear to be multiple levels of dimensions.

2.0 Equations

In an MIT course the Cherenkov radiation satisfied both a resonance and dispersion relation (1)

This is the following equation in their analysis.

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

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.

$$Cos\theta = \frac{1}{\beta} \qquad [2]$$

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

$\frac{Cos\theta}{2} =$ Possible emission solution angles. [3]

If we integrate the possible emission solution angles $\frac{Cos\theta}{2}$ from 0 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.

$$\int_0^{pi/2} (\frac{Cos\theta}{2})^9 d\theta \qquad [4]$$

If we set equation 4 equal to $\frac{P(1-P)}{\sqrt{3}}$ we obtain the following

$$\frac{P(1-P)}{\sqrt{3}} = \int_0^{pi/2} (\frac{Cos\theta}{2})^9 d\theta \qquad [5]$$

It is not known why setting equation [4] should be set equal to $\frac{P(1-P)}{\sqrt{3}}$. The value of $\sqrt{3}$ could be due to the Cherenkov nucleon type radiation going through a cuboctahedron angles of 54.73 degree or it could be the breaking up of force into 3 equal forces in the x, y, and z direction. Regardless the value of P yields two values which are called Px and Py as shown below.

Px=0.998623461644, Py=0.001376538356

The value of Px=0.998623461644, is very close to the ratio of the mass of the proton over the mass of the neutron. Which is equation [6] below.

$$\frac{Mp}{Mn} = 0.998623478023 \qquad [6]$$

The following equations of 7 and 8 propose that the mass of the electron has a small relativistic affect on the mass of the proton. This is not the actual electron, but because it would be an action inside of the proton nucleon, but is a hint that electron type of interactions are inside the proton as well. It also shows that there may be some relativistic affects within the nucleons and that masses are related to a dimensionless relationship to the speed of light as equation [7] appears to be a variation of the Lorentz factor.

$$\alpha = \frac{1}{\sqrt{1-(\frac{Me}{3Mn})^2}} = 1.00000001645 \qquad [7]$$

$$\frac{Mp}{Mn} = Px * \alpha = 0.998623461644084 * 1.00000001645 = 0.998623478023 \qquad [8]$$

$$\frac{Mp}{Mn} = 0.998623478023 \qquad [6]$$

Which is with less than one sigma of the proton-neutron mass ratio from Codata shown below.

Proton-neutron mass ratio m_p/m_n	
Value	0.998 623 478 44
Standard uncertainty	0.000 000 000 51
Relative standard uncertainty	5.1×10^{-10}
Concise form	0.998 623 478 44(51)

(4)

3.) Discussion

We see that Cherenkov type of radiation from the nucleons could offer some explanation for the mass of the proton. We also see that the equation use of integrating radiation angles to the ninth power, which may be an indication of the 9 physical dimension of string theory. More work needs to be done to determine why this particular equation for the proton neutron mass ratio and can this type of equation be applied to other particles of mass.

Brian Greene states in "The Elegant Universe". Page 203 (10), "Why does string theory require the particular number of nine space dimensions to avoid nonsensical probability values?" If one looks at how the fine structure, alternative derivation shown in "Evidence for Granulated Space" (8) Equation 2, shows that the aether is made of spheres made of spheres. The discontinuities inherent in a sphere made of spheres, being responsible for all properties we can measure, as evidenced by the calculations in "How can the Particles and Universe be Modeled as a Hollow Sphere." (9)

This paper doesn't show the universe is granulated, but does show it is possible that Cherenkov type radiation in the nucleon, could help account for the particular mass of particles.

References

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