The Lepton Masses and Dark Boson Orbitals
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Abstract

We found that Cherenkov radiation and Bremsstrahlung equations could give us the mass ratio of the proton to the neutron. The Cherenkov radiation is to the 9th power as if there are levels to the universe.

In the first part of this paper we revisit the equations for the proton neutron mass ratio, in the second part we show how this can applied to the leptons electron, muon, and tau and how the electron, muon, and tauon may come about by dark bosons changing orbitals.

The proton neutron mass ratio has serendipitously been found. When a charged particle travels faster than light, it emits Cherenkov radiation. When a charged particle is accelerated it emits a braking radiation called Bremsstrahlung. 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 of charged particles or superluminal movement of charged particles that causes the mass of the proton or other particles.

It is proposed that the ratios of the masses of particles to the mass of the neutron is related to ratio of the Bremsstrahlung to the Bremsstrahlung where velocity is parallel to acceleration.

In the case of the mass ratio of the proton to the neutron, the possible form of the 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 Cherenkov radiation angles summing the radiation angles from 0 to $\frac{pi}{2}$ angles, assuming an ideal case of a non-dispersive medium (where phase and group velocity are the same(14), 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 radiation and Cherenkov type radiation within the nucleons that causes some type of resonance that stabilizes the masses of the fundamental particles, which is further proposed to be a function of an orbital type structure of the nucleons. This resonance is potentially demonstrated for a proton.

The Leptons may use the same Bremsstrahlung Cherenkov radiation for setting up stable resonances for their mass ratios to the neutron. What we see is that the masses of the leptons, may be a mass that only becomes evident when a dark boson jumps from one orbital to another. Each particle would have its own dark boson. These may be the super symmetric particles that are proposed in string theory, but particles may have corresponding dark bosons.

This is a continuation of Sarnowski's Spinning Sphere Theory for the construction of the universe.

2.0 Equations for the Proton to Neutron ratio.

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.

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

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

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

And if we substitute p as follows, we get

$$p = \beta^2 = \frac{v^2}{c^2} \qquad [6]$$

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

$$\frac{\beta^2(1-\beta^2)}{\sqrt{3}} = \int_0^{pi/2} (\frac{Cos\theta}{2})^9 d\theta \qquad [7]$$

Beta^2=0.9986234616440841549678005

Or

$$\frac{\frac{v^2}{c^2}(1-\frac{v^2}{c^2})}{\sqrt{3}} = \int_0^{pi/2} (\frac{Cos\theta}{2})^9 d\theta . \qquad [8]$$

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

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.

$$P = \frac{q^2\gamma^6}{6\pi\epsilon c}(\dot{\beta}^2 * (1-\beta^2) - (\vec{\beta}\times\dot{\vec{\beta}})^2) \qquad [9]$$

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

$$P_{parallel} = \frac{q^2\gamma^6}{6\pi\epsilon c}\dot{\beta}^2_{parallel} \qquad [9.1]$$

When we divide Equation 9 by Equation 9.1 we obtain

$$\frac{P}{P_{parallel}} = \frac{\dot{\beta}^2 * (1-\beta^2) - (\vec{\beta}\times\dot{\vec{\beta}})^2}{\dot{\beta}^2_{parallel}} \qquad [9.2]$$

Lets propose that this equation contains some special situations.

1) $\dot{\beta}^2$ is constant and is equal to $\frac{1}{\sqrt{3}}$

2) $\dot{\beta}^2_{parallel} = 1$

3) $(\vec{\beta}\times\dot{\vec{\beta}})^2 = 0$

Then equation 9.2 becomes the following

$$\frac{P}{P_{parallel}} = \frac{1}{\sqrt{3}}(\beta^2(1-\beta^2))$$

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

We can then change the equation 5

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

To $$\frac{(\beta^2)(1-\beta^2)}{3^{0.5}} = \int_0^{pi/2} (\frac{Cos\theta}{2})^9 d\theta \qquad [10]$$

$$p_x = \beta_x^2 = 0.998623461644, \quad p_y = \beta_y^2 = 0.0013765383559915846 \qquad [10.1]$$

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 [11] appears to be a variation of the Lorentz factor.

$$\alpha = \frac{1}{\sqrt{1-(\frac{3^{0.5}\pi Me}{16Mn})^2}} = 1.0000000170555 \qquad [11]$$

$$\frac{Mp}{Mn} = px * \alpha = 0.998623461644084 * 1.0000000170555 = 0.9986234786761 \qquad [11.1]$$

$$\frac{Mp}{Mn} = 0.9986234786761 \qquad [11.2]$$

The value of $\beta_x^2 = 0.9986234786761$, is very close to the ratio of the mass of the proton over the mass of the neutron.

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

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	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)

If we take equation 10

$$\frac{(-\beta^2(1-\beta^2)-(\vec{\beta}\times\dot{\vec{\beta}})^2)}{\sqrt{3}} = \int_0^{pi/2} (\frac{Cos\theta}{2})^9 d\theta$$

It is possible that there are other factors. We could multiply the left hand side of the equation to an orbital energy level as shown in equation 11

$$\frac{\lambda_p}{\lambda_n}\frac{(-\beta^2(1-\beta^2)-(\vec{\beta}\times\dot{\vec{\beta}})^2)}{\sqrt{3}} = \int_0^{pi/2} (\frac{Cos\theta}{2})^9 d\theta \qquad [11]$$

Where $\frac{\lambda_n}{\lambda_p}$ is defined below.

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_p 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 proton 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 ratios of the wavelengths and the R_∞ ratio will become one. For the proton to neutron orbital energy ratio the following equation is proposed.

$$\frac{\lambda_n}{\lambda_p} = \frac{R_\infty(\frac{1}{n_{1p}^2} - \frac{1}{n_\infty^2})}{R_\infty(\frac{1}{n_{1n}^2} - \frac{1}{n_\infty^2})} \quad [12]$$

The following values are substituted in. $n_{1p} = 1$, $n_\infty = \infty$, $n_{1n} = 1$, $n_\infty = \infty$ which yields

$$\frac{\lambda_n}{\lambda_p} = \frac{R_\infty(\frac{1}{1^2} - \frac{1}{\infty^2})}{R_\infty(\frac{1}{1^2} - \frac{1}{\infty^2})} = 1 \quad [13]$$

Whatever the value of, R_∞, at the next level of dimensions, it cancels with the ratio in equation 2. Why have an equation for ratios of nucleon type of orbitals, when the ratio turns out to be "one". It will be shown in future preprints, that this ratio is needed for the electron, muon, tauon, and other particles.

3.) Equations for the mass ratio of the electron to the neutron

In "Mathematical Geometric Origin of Masses of Particles Proton and Electron" (1) the following equation was used to model a mass ratio of the Proton to the Neutron.

Equation 1 $P(1-P) = \sqrt{3}/2\int_0^1 x^4(1-x)^4\,dx$ (1)

This yields the following two solutions.

Where P_x~~0.998623461644084 and P_y~~0.00137653835591585

Compared to the Codata proton neutron mass ratio of

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 x 10^{-10}**

Concise form **0.998 623 478 44(51)**
(2)

In Bergman's "Observations of the Properties of Physical Entities Part 2 —Shape & Size of Electron, Proton & Neutron"(3) shows references to shapes of particles from his calculations. Although the magnetic moment shows that the size of the electron toroid proposed by Bergman, in "Spinning Charge Ring Model of Elementary Particles," (4) , it is also well known that this size electron toroid, on the order of 10^{-12} meters, requires the electron to be spinning faster than the speed of light. It will be shown in the future that the magnetic moment of the electron can also be achieved by summing many components of the electron at Planck length and Planck frequency scales. Regardless, Bergman's toroid shape, could have significance.

If we use the second solution to equation (1) P_y=0.00137653835591585 above, calculate a Lorentz transformation, and some dimensional corrections, we have the following Lorentz transformation.

Equation 2 $$\frac{1}{(1-(\frac{\pi * Py}{12^{0.5}})^2)^{0.5}} = \alpha = 1.00000077922996619330$$

If we use the first solution to the equation (1) of y=0.998623461644084 and the Lorentz transformation in equation 2 above of 1.00000077922996619330 we can develop the following equation.

Equation 3 $$(g)(1-g)3^{0.5} = \frac{1}{6}\frac{32}{27}\frac{1.00000077923}{0.998623461644}\int_0^{pi}(\frac{\sin x}{2})^9 dx$$

Equation 3 gives the solutions for z of

G_x= 0.0000906445574284686867 and G_y= 0.999909355442571531

If we propose that the electron is contained in six structures of
G_x=0.0000906445574284686867
Then we can multiply G_x by 6 in Equation 4

Equation 4 $$Gx * 6 = \frac{Me}{Mn} = 0.0000906445574284686867 * 6 = 0.00054386734446$$

$$\frac{Me}{Mn} = 5.4386734446 * 10^{-4}$$

Compare this to Codata Electron/Neutron mass ratio of

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}

6

Where do the values of $\frac{1}{6}$ and $\frac{32}{27}$ come from.

The value of $\frac{1}{6}$ comes from the 2 dimensional ring of 6 particles, this is explained as follows. There is a mystery in particle physics. What is the reason for the generations? What is the reason for the masses of the particles in the Standard Model. This paper shows that spinning sphere theory may explain the reason for the generations. In spinning sphere theory our universe starts with one particle for zero-dimensional point. Two particles for a one-dimensional string that corresponds to the Muon, Six particles for a two-dimensional ring, corresponding to the electron. 42 particles for the 2nd layer of a cuboctahedron for a three-dimensional particle, corresponding to the tauon. This section specifically focuses on the electron.

For the proton, in section 2 of this paper we found that the following equation, which would represent a ratio of orbital energy.

$$\frac{\lambda_n}{\lambda_p} = \frac{R_\infty(\frac{1}{n_{1p}^2} - \frac{1}{n_\infty^2})}{R_\infty(\frac{1}{n_{1n}^2} - \frac{1}{n_\infty^2})}$$

$$\frac{\lambda_{e1}}{\lambda_{e2}} = \frac{R_\infty(\frac{1}{1^2} - \frac{1}{2^2})}{R_\infty(\frac{1}{1^2} - \frac{1}{3^2})} = \frac{\frac{3}{4}}{\frac{8}{9}} = \frac{32}{27}$$

4.) Equations for the mass ratio of the muon to the neutron

What determines the mass of particles like the muon and tauon? No, reasonable, mainstream model, has been predictive the mass of particles. Michael John Sarnowski's empirical equations for the proton and electron use an equation that shows that a resonant frequency created by a resonance between bremsstrahlung and Cherenkov like radiation and the ratio of orbital energy ratios.(1) In those two papers the masses of the electron and proton are due one of the solutions the resonances. In addition a small fraction of the proton mass is due to relativistic effects of most of the electron, a small fraction of the electron is due to relativistic effects of the second solution to the mass equation of the proton. In "Evidence for Granular Granulated Spacetime it is shown that charge is directly dependent on the mass ratio of the electron to neutron and the proton to the neutron(2). These empirical equations are accurate to the CODATA values for the mass ratios of the electron to the neutron and the proton to the neutron. Also this equations are also predictive for the value for elementary charge. The following paper shows that the mass ratios of the muon to the neutron and the tauon to the neutron can be calculated from both solutions to resonant equation of a Cherenkov like radiation and Bremsstrahlung type radiation. These mass ratios are also accurate to the CODATA values for these two particles and are likely predictive of more accurate measurements of these particles in the future.

What is unique for the muon-neutron and tauon-neutron is that the mass ratios of the use the same resonance and use one of the solutions for the resonance of the proton to the neutron mass ratio. The consistent use of resonances, consistent use of mass ratios to the neutron, and consistent interdependence of the mass ratios of particles indicates that the developing model is consistent and hints at underlying structure to space-time.

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It is proposed that the ratios of the masses of particles to the mass of the neutron is related to ratio of the Bremsstrahlung to the Bremsstrahlung where velocity is parallel to acceleration.

This paper is an attempt of an explanation and derivation for the equation that very closely, within the known Codata 2014 mass ratio of both the muon and tauon to the neutron. An equation is developed below that uses the coupling dependence and Cherenkov radiation angles summing the radiation angles from 0 to $\frac{pi}{2}$ angles, assuming an ideal case of a non-dispersive medium (where phase and group velocity are the same(4), and integrating through what may appear to be multiple levels of dimensions. This is a continuation of Sarnowski's Sphere Theory for the construction of the universe.

2.0 Equations

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This is the following equation in their analysis.

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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.

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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 (4) 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.

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

If we set equation 4 equal to $p(1-p)$ we obtain the following

$$p(1-p) = \int_0^{pi/2} \left(\frac{Cos\theta}{2}\right)^9 d\theta \quad [5]$$

And if we substitute p as follows, we get

$$p = \beta^2 = \frac{v^2}{c^2} \quad [6]$$

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

$$\beta^2(1-\beta^2) = \int_0^{pi/2} (\frac{Cos\theta}{2})^9 d\theta \qquad [7]$$

Or

$$\frac{v^2}{c^2}(1-\frac{v^2}{c^2}) = \int_0^{pi/2} (\frac{Cos\theta}{2})^9 d\theta\,. \qquad [8]$$

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

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 electron to the neutron. Let's propose that this ratio may come about by calculating the ratio of the Bremsstrahlung type radiation of the Electron 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 constituent particles. If we look at the most established for Bremsstrahlung Radiation, we have the following.

$$P = \frac{q^2\gamma^6}{6\pi\epsilon c}(\dot{\beta}^2 * (1-\beta^2) - (\vec{\beta}\times\dot{\vec{\beta}})^2) \qquad [9]$$

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

$$P_{parallel} = \frac{q^2\gamma^6}{6\pi\epsilon c}\dot{\beta}^2_{parallel} \qquad [9.1]$$

When we divide Equation 9 by Equation 9.1 we obtain

$$\frac{P}{P_{parallel}} = \frac{\dot{\beta}^2 * (1-\beta^2) - (\vec{\beta}\times\dot{\vec{\beta}})^2}{\dot{\beta}^2_{parallel}} \qquad [9.2]$$

Lets propose that this equation contains some special situations.

1) For $\dot{\beta}^2$ is equal to $\frac{\frac{Mp}{Mn}\beta^2}{2}$ for exponential deceleration.

2) $\dot{\beta}^2_{parallel} = 1$ [9.3]

3) $(\vec{\beta}\times\dot{\vec{\beta}}) = 0$ [9.4]

4)

Then equation 9.2 becomes the following

$$\frac{P}{P_{parallel}} = \frac{Mp}{Mn}\frac{(\beta^2)(1-\beta^2)}{2} \quad [9.5]$$

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

We can then change the equation 5

$$p(1-p) = \int_0^{pi/2} (\frac{Cos\theta}{2})^9 d\theta \quad [5]$$

to

$$\frac{Mp}{Mn}\frac{(\beta^2)(1-\beta^2)}{2} = \int_0^{pi/2} (\frac{Cos\theta}{2})^9 d\theta \quad [9.6]$$

It is possible that there are other factors. We could multiply the left hand side of the equation to an orbital energy level as shown in equation 11

$$\frac{Mp}{Mn}\frac{(\beta^2)(1-\beta^2)}{2} = \frac{\lambda_\infty}{\lambda_{muontau}} \int_0^{pi/2} (\frac{Cos\theta}{2})^9 d\theta \quad [9.7]$$

Where $\frac{\lambda_\infty}{\lambda_{muontau}}$ is defined below.

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_∞ for the infinity orbital and $\lambda_{muontau}$ for the muontau. 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 muon and tau particle 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 ratios of the wavelengths and the R_∞ ratio will become one. For the muon and tau to neutron orbital energy ratio the following equation is proposed.

$$\frac{\lambda_\infty}{\lambda_{muontau}} = \frac{R_\infty\left(\frac{1}{n_{1muontau}^2} - \frac{1}{n_{2muontau}^2}\right)}{R_\infty\left(\frac{1}{n_{1\infty}^2} - \frac{1}{n_{2\infty}^2}\right)} \qquad [9.8]$$

The following values are substituted in. $n_{1muontau} = 2$, $n_{2muontau} = 4$, $n_{1\infty} = 1$, $n_{2\infty} = \infty$ which yields

$$\frac{\lambda_\infty}{\lambda_{muontau}} = \frac{R_\infty\left(\frac{1}{2^2} - \frac{1}{4^2}\right)}{R_\infty\left(\frac{1}{1^2} - \frac{1}{\infty^2}\right)} = \frac{3}{16} \qquad [9.9]$$

Whatever the value of, R_∞, at the next level of dimensions, it cancels with the ratio in equations 9.8 and 9.9

Equation 9.7 becomes Equation 9.10 with the equation 9.9 substitution

$$\frac{Mp}{Mn}\frac{(\beta^2)(1-\beta^2)}{2} = \frac{3}{16}\int_0^{pi/2}\left(\frac{Cos\theta}{2}\right)^9 d\theta \qquad [9.10]$$

This equation yields the following possible values for β^2

$\beta^2 = MTy = 0.000298118170815717 and MTx = 0.99970188182918$ If we take the first value

It appears from the following equations that the mass of the muon and tau is due to a combination of resonance from the proton resonance solution and from the muon tau resonance solution.

The relativistic correction

$$Lm = \frac{1}{\sqrt{1-\left(\frac{\pi MTy}{9}\right)^2}} = 1.0000000054. \qquad [9.11]$$

The value of $\frac{1}{9}$ comes from the following.

$$\frac{\lambda_{e1}}{\lambda_{e2}} = \frac{R_\infty\left(\frac{1}{2^2} - \frac{3}{4^2}\right)}{R_\infty\left(\frac{1}{2^2} - \frac{1}{4^2}\right)} = \frac{\frac{1}{16}}{\frac{3}{16}} = \frac{1}{3}$$

We also have the ratio of the one dimensional, two particle string, to the two dimensional six particle ring. This gives another factor of 1/3

$$\frac{1}{9}=\frac{1}{3}*\frac{1}{3}$$

Equation for Muon-Neutron Mass ratio

Equation 9.12

$$\frac{Mu}{Mn}=1-Lm*Px+\frac{MTx}{9}=1-1.0000000054*0.998623461644084+\frac{0.99970188182917}{9}=.1124545198$$

Which compares to 2014 Codata of

muon-neutron mass ratio m_μ / m_n	
Value	0.112 454 5167
Standard uncertainty	0.000 000 0025
Relative standard uncertainty	2.2×10^{-8}
Concise form	0.112 454 5167(25)

5.0 Tauon Neutron Mass Ratio

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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.

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

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$$P_{parallel} = \frac{q^2\gamma^6}{6\pi\epsilon c}\dot{\beta}^2_{parallel} \qquad [9.1]$$

When we divide Equation 9 by Equation 9.1 we obtain

$$\frac{P}{P_{parallel}} = \frac{\dot{\beta}^2 * (1-\beta^2) - (\vec{\beta}\times\dot{\vec{\beta}})^2}{\dot{\beta}^2_{parallel}} \qquad [9.2]$$

Lets propose that this equation contains some special situations.

5) For $\dot{\beta}^2$ is equal to $\frac{\frac{Mp}{Mn}\beta^2}{2}$ for exponential deceleration.

6) $\dot{\beta}^2_{parallel} = 1$ [9.3]

7) $(\vec{\beta}\times\dot{\vec{\beta}}) = 0$ [9.4]

8)

Then equation 9.2 becomes the following

$$\frac{P}{P_{parallel}} = \frac{Mp}{Mn}\frac{(\beta^2)(1-\beta^2)}{2} \qquad [9.5]$$

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

We can then change the equation 5

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

to

$$\frac{Mp}{Mn}\frac{(\beta^2)(1-\beta^2)}{2} = \int_0^{pi/2}(\frac{Cos\theta}{2})^9 d\theta \qquad [9.6]$$

It is possible that there are other factors. We could multiply the left hand side of the equation to an orbital energy level as shown in equation 11

$$\frac{Mp}{Mn}\frac{(\beta^2)(1-\beta^2)}{2} = \frac{\lambda_\infty}{\lambda_{muontau}}\int_0^{pi/2}(\frac{Cos\theta}{2})^9 d\theta \qquad [9.7]$$

Where $\frac{\lambda_\infty}{\lambda_{muontau}}$ is defined below.

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_∞ for the infinity orbital and $\lambda_{muontau}$ for the muontau. 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 muon and tau particle 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 ratios of the wavelengths and the R_∞ ratio will become one. For the muon and tau to neutron orbital energy ratio the following equation is proposed.

$$\frac{\lambda_\infty}{\lambda_{muontau}} = \frac{R_\infty(\frac{1}{n_{1muontau}^2} - \frac{1}{n_{2muontau}^2})}{R_\infty(\frac{1}{n_{1\infty}^2} - \frac{1}{n_{2\infty}^2})} \qquad [9.8]$$

The following values are substituted in. $n_{1muontau} = 2$, $n_{2muontau} = 4$, $n_{1\infty} = 1$, $n_{2\infty} = \infty$ which yields

$$\frac{\lambda_\infty}{\lambda_{muontau}} = \frac{R_\infty(\frac{1}{2^2} - \frac{1}{4^2})}{R_\infty(\frac{1}{1^2} - \frac{1}{\infty^2})} = \frac{3}{16} \qquad [9.9]$$

Whatever the value of, R_∞, at the next level of dimensions, it cancels with the ratio in equations 9.8 and 9.9

Equation 9.7 becomes Equation 9.10 with the equation 9.9 substitution

$$\frac{Mp}{Mn}\frac{(\beta^2)(1-\beta^2)}{2}=\frac{3}{16}\int_0^{pi/2}(\frac{Cos\theta}{2})^9 d\theta \qquad [9.10]$$

This equation yields the following possible values for β^2

$\beta^2 = MTy = 0.000298118170815717 and MTx = 0.99970188182918$ If we take the first value

It appears from the following equations that the mass of the muon and tau is due to a combination of resonance from the proton resonance solution and from the muon tau resonance solution.

The relativistic correction

$$Lm=\frac{1}{\sqrt{1-(\frac{\pi MTy}{9})^2}}=1.0000000054. \qquad [9.11]$$

The value of $\frac{17}{9}$ is proposed to come from orbital ratios and a ratio of 3rd dimensional cuboctahedron 2nd layer of 42 spheres and the one dimensional string of two spheres and the $\frac{1}{9}$ value of the muon.

The Muon is the 2nd Generation of the Leptons. The following is an empirical calculation for the ratios of energy levels of the Muon. Currently, no one has figured out the reason for the generations of the particles, or the phenomena that causes the mass of the particles. This empirical model is being developed. As it is being built, the mechanics of it may begin to be understood. It is assumed, that when taking the ratios of the energy levels of the dark orbitals, that the other variables cancel out. Note that there is also a factor of $\frac{2}{6}$ This factor comes from the ratio of particles in the one-dimensional string and the 2-dimensional ring. The two-dimensional ring corresponds to the electron, the one-dimensional string corresponds to the muon. The three-dimensional 2nd layer of the cuboctahedron corresponds to the tauon.

Ratio of Energy levels.

$$(\frac{1}{2^2}-\frac{1}{4^2})=\frac{3}{16}$$

$$(\frac{1}{2^2}-\frac{3}{4^2})=\frac{1}{16}$$

Origin of the almost one ninth value of the muon to neutron mass ratio.

$$Oneninthvalue=\frac{particlesinonedimensionalstring}{particlesintwodimensionalring}*ratioooforbitalenergies$$

$$\frac{1}{9}=\frac{2}{6}\frac{\frac{1}{16}}{\frac{3}{16}}$$

The value of one ninth, above is for the muon. The mass of the Tauon is an extension of the Muon. The Tauon value of 17/9 of the proton or neutron is the one ninth of the ratio of the muon times 17. The Tauon is a fractal of the two=dimensional and three-dimensional construct of the universe.
Ratio of the Energy levels of the Tauon.

$$(\frac{1}{2^2}-\frac{1}{5^2})=\frac{21}{100}$$

$$(\frac{1}{2^2}-\frac{2}{5^2})=\frac{17}{100}$$

$$seventeenninthsvalue = oneninthmuonvalue\,\frac{particlesinthreedimensionalcuboctahedron2ndlayer}{particlesintwodimensionalring} * ratiooforbital$$

$$\frac{17}{9}=\frac{2}{6}\frac{\frac{1}{16}}{\frac{3}{16}}\frac{42}{2}\frac{\frac{17}{100}}{\frac{21}{100}}$$

Equation for Tauon-Neutron Mass ratio

Equation [9.13]

$$\frac{Mt}{Mn}=(2*(1-Lm*Px)+\frac{17*MTx}{9}=2*(1-1.0000000054*0.998623461644084)+\frac{17*0.99970188182917}{9}$$

$$\frac{Mt}{Mn}=1.8910789$$ Within one sigma of Codata 1.89111 and within0.99998

Which compares to 2014 Codata of

tau-neutron mass ratio m_τ / m_n
Value 1.891 11
Standard uncertainty 0.000 17
Relative standard uncertainty 9.0 x 10^{-5}
1.891 11(17)
Concise form

6.) Discussion

We see that Cherenkov type of radiation from the nucleons could offer some explanation for the mass of the leptons. 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.

Equation 7 and 8 show that there could be some relationship between Cherenkov radiation to Bremsstrahlung radiation when calculating the mass ratio of the proton to the neutron. It is also interesting to note that the ratio would be equivalent to some type of ratio of velocity of a particle squared to the speed of light squared.
This relationship isn't proven, but the relationship seems to be more than mere coincidence. It seems to be a start to finding the causes for the mass relationships of particles.

It is not known why the value of $\beta^2 * (1-\beta^2)$ should be used. It however does look like it would be a special case of Bremsstrahlung radiation, which in here, it is named a special case of Nucleon Bremsstrahlung Radiation.

The equation, $\frac{(\beta^2)(1-\beta^2)}{3^{0.5}} = \int_0^{pi/2} (\frac{Cos\theta}{2})^9 d\theta$, is empirical for the proton/neutron mass ratio. Since we cannot actually see at 10^{-35} *meters* or ever hope to, it is likely that the equations will continue to be empirical unless overwhelming evidence shows Sarnowski's Sphere Theory to be a consistent model for the universe and particles. However it may be possible to improve on Equation 9 shown below.

$$P = \frac{q^2\gamma^6}{6\pi\epsilon c}(\dot{\beta}^2 * (1-\beta^2) - (\vec{\beta} \times \dot{\vec{\beta}})^2) \qquad [9]$$

If we look at equation 9 it can be simplified under certain conditions. For the situation when the velocity is parallel to acceleration the equation simplifies as follows. (14)

$$P_{aparallelv} = \frac{q^2\gamma^6}{6\pi\epsilon c^3} \qquad [14]$$

Or when velocity in perpendicular to acceleration, then

$$P_{a\,perpendicular\,v} = \frac{q^2\gamma^4}{6\pi\epsilon c^3} \qquad [15]$$

We can see that it is conceivable that the left hand side of equation 10, $\frac{(-\beta^2(1-\beta^2)-(\vec{\beta}\times\dot{\vec{\beta}})^2)}{\sqrt{3}}$, could be part of some ratios of special conditions of Bremsstrahlung radiation like equations 14 and 15.

> We see the possibility that the ratio of the mass of the proton to the neutron could also be related to a nucleon type of orbital, and we see that the leptons masses may also include a relativistic component related to the proton mass. We also see, consistently that particles seem to be related to a geometric factor related to 90 and 60 degree angles, both observed in a cuboctahedron structure.

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)

In the following quote it is indicated that vibrating strings at certain resonances could account for forces and masses.

The basic idea behind **String Theory** is that all of the different "fundamental particles" of the Standard Model are really just different versions of one basic object: - a vibrating oscillating string. Ordinarily an electron is pictured as a point with no internal structure. A point cannot do anything but move. But, if string theory is correct, then under an extremely "powerful microscope" (way beyond today's capabilities) we would realize that the electron is not really a point, but a tiny loop of vibrating string (sometimes called a filament). A string can do somethings besides move - it can oscillate in different ways. If it oscillates one way, then from a distance we see an electron and we are unable to tell it is really a string. But if it oscillates some other way, we call it a photon, or a quark, and so forth. If **String Theory** is correct, the entire universe is made of oscillating strings. See the illustration at the left showing some strings that might make up a quark.[12]

In Sarnowski’s Sphere Theory it is not strings, but rotating spheres and imperfections that may be creating these stable resonances that give properties to our universe. This paper doesn’t show the universe is granulated, but does show it is possible that Cherenkov type radiation and Bremsstrahlung radiation in the nucleon, could help account for the particular mass of particles.

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