Mass Ratio Calculation of Kaon Mesons to the Proton

1.0 Abstract

The Kaon Mesons masses are known relatively well so it is easier to use to characterize the masses of the mesons. The following paper shows that the Kaon meson mass formula is consistent with the other meson formulas used by this author. The same basic integrated polynomial is use. The basic sub formulas are also consistent between mesons. The positive and negative Kaon use the same formula as the Rho meson, except in the sub formula 14/27 is used for the positive and negative Kaon instead of 22/27 for the rho meson. As has been noted by **Paolo Palazzi,** (10) the mesons can be characterized as parts of 27 and all even parts of 27. The author of this paper has not characterized all of the mesons to verify if this follows for all the mesons, but it has held for the pion, rho, and kaons. The value of 27 has been used in all the polynomial calculations and the sub formula's. It is getting less and less doubtful that this is coincidental. To this point on 9-6-2015 this author had worked out the formulas for the electron, muon, tauon, pion, rho, and kaon particles independent of Paolo Palazzi's work, without knowledge that anyone had noticed the pattern of 27 previously, although the pattern was so obvious, except in the case of the electron, that is seemed unlikely that it had not been noticed previously. The high mass mesons, have such a large mass, that it would be difficult to determine that the pattern of 27 was used or if it was simply numerology and coincidental curve fitting. This paper uses the same technique for proposing a method that gives clues to the mass ratio of mesons to the Proton. This is for the mesons made of, at least one, up or down quarks or their anti quarks. The structure of the equations are such that the masses are related to a type of probability. For example, the 10 percent chance an emission of energy would be going in the x direction vs the 90 percent in the y direction.

2.0 Calculations Kaon$^{\pm}$

In Mass Ratios of Elementary Particles (11), the following equation is developed. Where Px is very nearly the mass ratio of the Proton to the Neutron, and in that paper is corrected to within one sigma of the mass ratio of the proton to the neutron with a Lorentz transformation. (6)

Equation 2.1 $P(1-P)=\sqrt{3}/2\int_0^1 x^4(1-x)^4\,dx$ (6)

This yields the following two solutions.

Where Px~~0.998623461644084 and Py~~0.00137653835591585

Section 2.1 Mass Ratio of Kaon K$^{\pm}$ to the Proton

The following equations are proposed for modeling the mass of the Kaon K$^{\pm}$ mesons to the Proton. The same methods for calculation are used here as for other papers by Michael John Sarnowski. (6)(9) These equations are part derivation and part models at this time. It is hoped that at some point they will be more derivation. What happens when the rotation of one rotating sphere aligns with the rotation of another rotating sphere? This model and empirical numbers are trying to get a grasp of what is happening. The model does have an uncanny ability to develop similar repeating patterns for calculations of the masses of particles. This is also seen in the following paper "Energy Derivation of Mass Ratios of Elementary Particles"(6)

The following equation is proposed for starting the calculation for the Kaon plus/minus particles.

Equation 2.1.1

$$K(1-K)=27/(Px64)\int_0^1 x^2(1-x)^2\,dx=27/(0.998623461644084*64)\int_0^1 x^2(1-x)^2\,dx \quad (1)$$

This yields the following two solutions.

Where Kx=0.9857140267128
and Ky = 0.014285973287183

As developed for other mass ratios a Lorentz factor is developed using the second solution to the integrated binomial above

Equation 2.1.1.1 $\alpha=\dfrac{1}{\sqrt{1-(\frac{3Ky}{2})^2}}=1.0002296792664802...$

$$\alpha=\frac{1}{\sqrt{1-(\frac{3*0.014285973287183}{2})^2}}=1.000229679266$$

We see, with Equation 2.1.2 below, that we can obtain the Mass of the Kaon $K^{\pm}$ Mesons

Equation 2.1.2 $K^{\pm}=\alpha ProtonMassMeV\dfrac{1}{Kx}\dfrac{14}{27}$

$$K^{\pm}=1.000229679266*938.272046MeV)\frac{1}{0.98571402}\frac{14}{27}=493.6758MeV)$$

This compares to K±: 493.667±0.013 MeV/c^2

Note: Due to the limited accuracy of the Kaon mass, and the lack of a complete knowledge of the mechanics of the particles, it is not known if the parameters of the Lorentz factor in equation 2.1.1.1 is correct enough. Another digit of accuracy in the Kaon's mass would be helpful.

The following equation is proposed for starting the calculation for the Kaon zero particle.

Equation 2.1.3

$$K(1-K)=27*3/(Px128)\int_0^1 x^2(1-x)^2\,dx=27*3/(0.998623461644084*64)\int_0^1 x^2(1-x)^2\,dx \quad (1)$$

This yields the following two solutions.

Where Kx= 0.97841109270093

and Ky = 0.021588907299066

As developed for other mass ratios a Lorentz factor is developed using the second solution to the integrated binomial above

Equation 2.1.3.1 $\alpha = \frac{1}{\sqrt{1-(\frac{16Ky}{9})^2}} = 1.0002296792664802...$

$$\alpha = \frac{1}{\sqrt{1-(\frac{16*0.021588907299066}{9})^2}} = 1.00073733763191068 \$$$

We see, with Equation 2.1.2 below, that we can obtain the Mass of the Kaon K^0 Mesons

Equation 2.1.2 $K^0 = \alpha ProtonMassMeV \frac{1}{Kx}\frac{14}{27}$

$K^0 = 1.00073733*938.272046MeV)\frac{1}{0.97841109270093}\frac{14}{27} = 497.613MeV)$This compares to K^0=497.614±0.024

Note: Due to the limited accuracy of the Kaon mass, and the lack of a complete knowledge of the mechanics of the particles, it is not known if the parameters of the Lorentz factor in equation 2.1.1.1 is correct enough. Another digit of accuracy in the Kaon's mass would be helpful.

3.0 Discussion

It is clear that Equation 2.1.2 and 2.1.3 yields a number that is within one sigma of the mass of the kaon meson. It appears that the mesons are related to 1/27 of the mass of the proton, which has been the case for every meson checked to this point. The mechanism that gives rise to the original integrated polynomial is not known, however it is suspected that it has to do with the probability of angular momentum be transferred between particles in an x, y, or z direction. It is also suspected that the equations above, may be a simplification and there may be an x, y, and z component to the masses.

4.0 References

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2) http://physics.nist.gov/cgi-bin/cuu/Value?mpsmn
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