Mass Ratio Calculation of Rho Mesons to the Proton

1.0 Abstract

The Rho Mesons mass is not known as well as the Pions and Kaons. 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.

2.0 Calculations Rho

In Mass Ratios of Elementary Particles, 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 Neutral Pion $\rho^{0\pm}$ to the Proton

The following equations are proposed for modeling the mass of the Rho mesons. The rest masses of the Rho mesons are very similar, and not known as accurately some of the other particles. 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 a some point they will be more derivation. What happens when one rotating sphere aligns with 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)

Equation 2.1.1

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

This yields the following two solutions.

Where Rx=0.9857140267128
and Ry = 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 $\alpha = \dfrac{1}{\sqrt{1-Ry^2}} = 1.00010206013866301...$

$$\alpha = \frac{1}{\sqrt{1-.014285973287183^2}} = 1.00010206013866301...$$

We see, with Equation 2.1.2 below, that we can obtain the Mass of the Rho Mesons

Equation 2.1.2 $$\rho^{0\pm} = \alpha ProtonMassMeV \frac{1}{Px}\frac{22}{27}$$

$$\rho^{0\pm} = 1.000102060 * (938.272046 MeV)\frac{1}{0.9857140267128}\frac{22}{27} = 775.677295 MeV$$

This compares to 775.4(0.4)MeV for the charge rho meson and 775.49(0.34)MeV for the neutral rho meson. The rho meson's mass is not known as accurately as other mesons. It is expected that the Lorentz factor above is only a rough guess.

3.0 Discussion

It is clear that Equation 2.1.2 yields a number that is within one sigma of the mass of the rho 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. It will also be shown to be the case for the Kaon meson's as well.
The mechanism that gives rise to the original integrated polynomial is not know, 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 man be an x, y, and z component to the masses.

4.0 References

1) http://vixra.org/pdf/1502.0193v2.pdf
2) http://physics.nist.gov/cgi-bin/cuu/Value?mpsmn
3) http://physics.nist.gov/cgi-bin/cuu/Value?mesmn|search_for=electron+neutron+mass+ratio
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