Einstein γ- factor contributes to Quantization of restmass?

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Abstract:

In Quantum- Physics the usage "quantized" means certain discrete values exist. The restmass of fundamental particles known from experiment to be quantized by certain experimental restmass value do not have a theoretically background in the way that a certain quantum number (Eigenvalue) exists. We show in this short paper that quantization of restmass is possibly contributed by the γ-factor of Einstein's Theory.

Introduction

In Quantum- Physics the discrete values are eigenvalues of an operator. [1] For the electron restmass or its electron-neutrinos such "Eigen-Values" don't exist by theory up to now [2]. Quantum mechanics (quantum physics or quantum theory), including field theory, is a branch of physics which is the fundamental theory of nature at small scales and energy levels of atoms and subatomic particles.[3] Classical physics (classical mechanics and relativity) is the physics existing before quantum mechanics and refers to theories of physics that do not use the quantization paradigm.[4] General Relativity and Quantum Mechanics are not directly contradicting each other theoretically but they have proven extremely difficult to incorporate into one consistent, cohesive model.[5] General relativity is the (continuous) geometric (field-) theory of gravitation published by Albert Einstein in 1915.[6] Special Relativity was originally proposed in 1905 by Albert Einstein in the paper "On the Electrodynamics of Moving Bodies".[7] Special Relativity describes the relationship between continuous space and time, excludes gravity, and assumes velocity of light in vacuum is a fundamental constant in nature which excludes (energy based) simultaneity in physics generally, and also shows the Energy-Contribution of high speed particles assuming restmass.

The relativistic mass-contribution from Einstein's Theory [8] is an important part in particle physics:

1. $E(v,c) = m_0 \cdot \frac{1}{\sqrt{1-\left(\frac{v}{c}\right)^2}} \cdot c^2$

Here m_0 is the (constant invariant) restmass of the (discrete) particle and (v) is its relative velocity and c is the velocity of light in vacuum. So in $E=\gamma*m_0*c^2$ appears the relativistic gamma-factor to be compared with formula 1 but of course it does not reveal the true nature of the quantized restmass of the electron for instance.

"I would like to know what an electron is." Or: "A theory that assumes restmass and charge a priori is incomplete." (Albert Einstein)

Novel Theoretical Speculation:

Quantization of restmass of the fundamental particles like Electron and Electron-Neutrinos must arise from internal dynamics is the novel aspect. So for now we assume that internal action exists and this action appears as being restmass. So this action requires relativistic momentum and energy contribution to be taken into account. In so far the self-energy (restmass) can be defined by Einstein's formula in the following way again. But a new aspect concerning the internal action velocity (v_{int}) not zero appears and is different to that of the relative velocity (v) from above (formula 1).

Therefore:

2. $E(v_{int}, c_i) = m_{00} \cdot \frac{1}{\sqrt{1-\left(\frac{v_{int}}{c_i}\right)^2}} \cdot c^2$

Hint: c_i is velocity of light. "i" indicates the matter, vacuum or not vacuum.

m_{00} is the initial (generated) restmass due to internal action and so the Einstein "gamma-factor" above should contribute to the "mass" as usual. Here m_{00} is the (formally) defined "basic" quantized restmass-unit. So the next formula reflects our speculation about "internal action that defines quantized restmass" by the following contribution.

3. $(v_{int}/c_i) = (n/n_i)$

n and ni are quantum numbers by hypothesis (Eigenvalues of a Quantum Theory are not available). The so defined quantized gamma-contribution coming up with $\gamma=(n_i/n_j)$ is only possible with certain discrete numbers (n,ni) from above. For the moment (ni/nj) might be interpreted physically as being a matter based discrete refractive-index-ratio. Supposing the internal process of mass-generation does exist the relativistic energy formula reads:

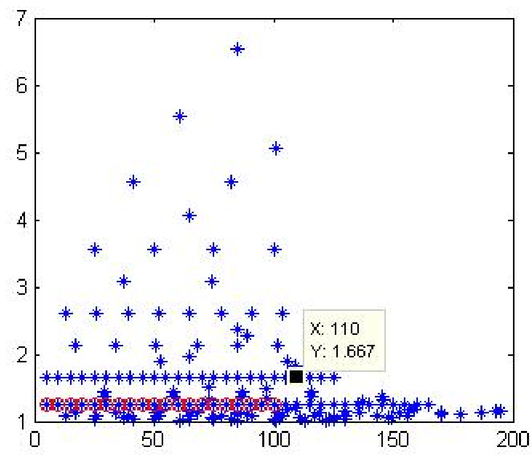
4. $E(n/n_i)=m_{00}*\gamma(n/n_i)*c^2=m_{00}*(n_i/n_j)*c^2=m_0*c^2$

m_0 is the discrete restmass (of a slow moving particle) which can be measured in experiments while the initial (quantized fundamental) restmass m_{00} is hidden behind the generating mass process [2]. The quantum aspect is shifted now to the γ-contribution. So this contribution is only a part of a solution once hopfully revealed by a completed relativistic quantum theory.

The internal velocity ($v_{int}=c/n$) and therefore the eigenvalue n is a speculation for the moment. The same holds true for $c_l=c/n_i$. Nevertheless the discrete gamma-factor-contribution can be calculated while <u>only</u> “single” (ni,nj) combinations are possible (figure 1) with more or less probability while starting with a single internal (n/ni) ratio.

Quantization and Degeneration of the Relativistic γ-Contribution

As a first example we start with gamma=1/sqrt(1-(3/5)^2)=5/4 = n_i/n_j and can see the “degenerated” discrete gamma-factor (red circles in figure 1) starting with: $n_i/n_j=5/4=1.25$.



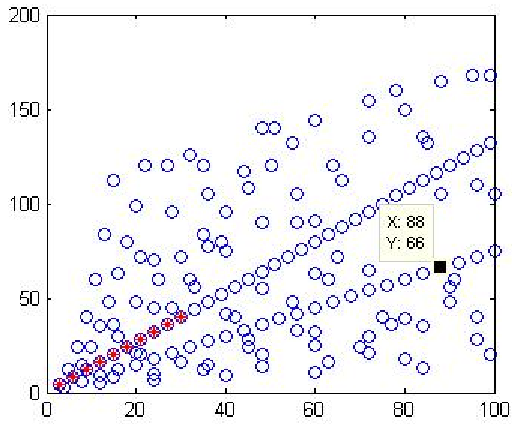


Figure 1: y=gamma-value (x)

figure 2 y=n(x)

The red circles in figure 1 (horizontal degeneration spots) represent the same gamma-factor y=1.25 starting with (5/4) =(n_i/n_j) on the left side of the picture while the x-value in figure 1 is (n_i). In figure 2 the y-value is equal to (n) and the x-value is defined by $x=\text{sqrt}(n_i^2-n^2)$. The root must be an integer based number by (physical) hypothesis! Therefore we have a discrete pattern of relativistic mass-quantization (figure 1) by the γ-contribution. The next gamma-generation (circles with less slop, notice the little less “probability” in figure 2, due to less density of circles) starts with: (5/3)=1.667 in figure 1 (next step upward relative to the red circles). The same result 1.667 gives the quantum-combination (110/66)=1.667 (black square in both figures belong together).

Conclusion:

Quantization and degeneration of mass due to the quantized γ-factor is based on the background of combinatorics within (ni/nj) (refractive index ratio). So statistical quantization required form Quantum Mechanics now is possibly revealed by a Relativistic Physics Contribution!

Degeneration example: $n_j^2=n_i^2-n^2=\mathbf{5}^2-\mathbf{4}^2=\mathbf{3}^2$ or $110^2-88^2=66^2=(22*\mathbf{5})^2-(22*\mathbf{4})^2=(22*\mathbf{3})^2$ lead to the same 1.667 gamma- factor (γ=**5/3**)=(ni/nj).

Here quantization shown by increasing gamma-factors:
(ni/nj)=(5/4), (5,3), (13/5),(17/8), (25/7), (37/12),(41/9),(65/25),(61/11)

Here quantization shown by decreasing gamma-factors:
(ni/nj)=)=(5/4), (13/12),(17/15), (25/24), (37/35),(41/40),(65/63),(61/60)

Application of the discrete gamma-values might lead us to explain the difference of so many neutrino mass-bound values from different experiments. These data mostly are measured with the same accuracy.

I think you should know this new part of relativistic physics surprisingly contributing to quantization which might have further application as usual when dealing with Einstein’s results.

Literature

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