Photons and β± Particles

Mduli Y*

Cape Town, South Africa

*Corresponding author: Mduli Y, Cape Town, South Africa, Email: mduliyanga@gmail.com

Abstract

The author writes this paper to try and compare his theory with quantum electrodynamics. The hope is to show the differences between the two frameworks so as for the experimental physicists to see which theory is leading us astray and which is in the right as far as the experiments can reveal. Our discussions will be about the reactions of light with light giving rise to light. The reaction of light with light giving rise to matter. And pair annihilation with pair creation. The decay reaction of particles like positronium with also particles of the same type such as neutral pions, Z0 bosons and higgs bosons. For instant in QED pair annihilation of an electron and positron can create an electron neutrino and its antiparticle and yet in the author's theory this is not only improbable but impossible.

Keywords: Pair Creation; Pair Annihilation; Electromagnetic Force; QED

Discussion

In QED there's is no rules against two identical photons with zero resultant momentum from creating four or six identical photons though it might be improbable it's not impossible [1]. In our theory this is impossible as any reaction with photons as the only reactants where the products is only photons, the products are always identical to the reactants. In QED two identical photons with zero sum momenta and sum energy just a little greater than the sum rest energy of a muon and antimuon can create the muon antimuon pair but there's also a probability of them creating an electron and positron pair. Our theoretical framework forbids this those two photons can only create the muon antimuon pair and can't create the electron positron pair. QED allows for the creation of a positronium plus a photon from the annihilation of an electron positron pair. Our theory doesn't allow such a reaction it's impossible. QED regards positronium as composite particle made up of an electron and positron coupled together by a sea of virtual photons, electrons and positrons. In our theory the positronium is an indivisible particle with the Dirac

properties of an electron and positron and there are no virtual particles all particle is on shell mass and hence don't violate the energy-momentum relation. A positronium with zero momentum in our system has but one possible decay reaction it annihilates creating two identical photons with net momentum zero while this is also true in QED it's not the only possible decay reaction for positronium at rest. QED allows for (π0,e-)e+ when the neutral pion is at rest and also (π0,2γ). Our theory forbids the first reaction though it allows for its reverse reaction thus (π0,e-)e+ is impossible but e-(e+,π0) is possible and (π0,2γ) is possible,(π0,μ-)μ+ is possible though irreversible and (π0,π-)π+ is possible but also irreversible and yet in QED all these irreversible reactions are not only possible but they are reversible too as there's no rule in QED that prevents this from happening. These two reactions μ-(μ+,e+)e- and e-(e+,μ+)μ- are both possible in QED but in our theory the first is impossible and the second is possible. The emission of a photon is a decay reaction which means only unstable particles can decay and hence an electron or positron can't emit as both are stable. Hence and electron can't emit a photon of any kind either it be a real or virtual photon. Now it's clear or

we hope it gets clear to the reader that this theory we are unveiling breaks with QED and classical electrodynamics as bodies don't emit light because they are made up of electrically charged particles trapped in potential wells. What we offer is the postulate that bodies emit photons because they composed of atoms such as the hydrogen atom(protium) which though indivisible has other excited hydrogen atoms whom are also indivisible but with higher rest masses than the unexcited hydrogen and hence all decay to it plus photons. So unlike in QED where emission of photon in the case hydrogen is the result of an electron making a quantum leap from a higher stationary state to a lower energy state as a result of vacuum fluctuations and the creation of photon in the electromagnetic field, in our theory there are no fields but only real photons and real matter particles and an excited hydrogen atom is just an indivisible particle with a rest mass greater than that of the unexcited atom such that this excited atom is an unstable particle which decays that's annihilates with the creation a stable atom which is an unexcited atom plus a photon. So, bodies emit photons because they composed of unstable atoms which decay to stable atom by annihilating and creating those stable atoms plus photons. And thus, if the unexcited atom is also unstable such bodies composed of such particles can't emit photons as the excited atoms will decay in similar fashion to the unexcited atoms, this is the case with tritium hydrogen it has no emission spectrum though it does have an absorption one. And also, a collection of electrons with a temperature that's above absolute zero will not emit any photons which is not the case for hydrogen atoms with an above absolute zero temp they do emit photons. QED allows (e±,e±)γ while our theory doesn't. And QED allows for (3H0*,3H0)γ where 3H0* is an excited tritium atom but our theory doesn't as it says only this can occur (3H0*,3He0 'νe)w just like unexcited tritium atom (3H0,3He0 'νe)w. QED allows e-(3H+,3H0)γ and our theory forbids it instead only this is possible e-(3H+,3He0 'νe)w.

Now the readers will probably ask themselves a bewildering amount of questions and they are justified. Such question can take on the form what are the rules from which we derive our predictions from our theory? Hasn't it been proven that atoms and positronium and such are composite particles? and don't we need virtual particles to explain the electromagnetic force? The first question is the rule we use is that whenever reactants have products of lower sum rest mass than theirs the products must be those with the least sum rest mass lesser that of the reactants e.g. the case of a positronium with zero momentum it could decay to an electron neutrino antielectron neutrino pair or to two photons but since two photons have zero sum rest mass as each

photon has zero rest mass and the neutrino antineutrino pair has a sum rest mass greater than zero as each particle has a rest mass that is greater than zero therefore the products with the least sum rest is two photons. The other rule is which a compliment of the first is whenever reactants have products with higher sum rest mass than theirs the products must be those with the greatest sum rest mass greater that of the reactants e.g. the case of two identical photons with zero net momentum with sum energy just a little greater than the sum rest energy of a muon antimuon pair, the photons could create a pair of a neutrino antineutrino or positronium or an electron positron pair or a neutral pion or a muon antimuon pair but since the muon antimuon pair has the greatest sum rest mass of all the other products the photons can only create the muon antimuon pair. The second question has already been answered in the early discussions in page two. Question number three is much more complex, in QED the electromagnetic force is mediated by virtual photon and electromagnetic radiation is made up of real photons. Now in our framework only real photons exist and are the quanta of visible light, ultraviolet and gamma rays and such. They are not created as a result of oscillating charges or quantum jumps and hence are not electromagnetic in nature [2]. So, what mediates the electromagnetic force between charges and magnets? The answer is nothing, the electromagnetic force can be explained in a similar fashion to the way the gravitational force is explained, firstly the reader must know in this theory a little principle which we have been using in this paper without naming it the annihilation-creation principle. This principle is that in any reaction the reactants are annihilated and the products are new creations. And another fundamental postulate that quanta e.g. electrons, neutrinos, mesons, baryons, nuclides, atoms and molecules are not only indivisible but are also immutable which each particles can't change its velocity and thus moves with constant speed from creation till annihilation and thus what we regard as gravitational force or electromagnetic force are nothing more than the annihilation of particles and the creation of other particle of the same type with different energies and hence velocities, without acceleration and force. Our theory leads us to the idea that maybe when there's an electron and positron a certain nonzero distance from each other after an certain nonzero duration infact after time given by the distance between the particles divided by the speed of light the two particles will annihilate and a new electron and positron will be created with different energies from their annihilated counterparts without anything having been transferred between those annihilated particles which gave rise to the new created particles. These created particles will exist for a nonzero duration and also the new space they are created with

and this space has energy just like a photon or an electron and like these particles it can't have zero or infinite energy. The energy of any created space is finite and nonzero and the energy of any space is directly proportional to its volume and its density is constant such that a bigger space has more energy than a small space. When space is annihilated a space of different energy and hence volume is created always it is never the case that a space is annihilated and a space of the same volume is created. Since each created space has finite energy it has finite volume and thus must be unbound and thus in this framework the global structure of space has nothing to do with the amount of matter that exists but its local structure does reflect the distribution of matter at the moment this space is created and retains such a geometrical structure from creation till annihilation. Since when a space is annihilated with all its quanta a new space is created with new quanta are created, where the volume of the new space is either greater or lesser than the volume of the annihilated space. This is a possible explanation of the accelerated expansion of the universe as each annihilated space is replaced by a bigger created space.

It's the author's hope that since the predictions made in this paper are way within accessible energy scales that experimental physicists could investigate and check if they are in error or better approximations of experimental data. And for theorists to check if the ideas presented here pertaining to the problem of reconciling relativity and particle physics are of any worth.

References

1. Feynman R (1955) The Principles of QED.
2. Weinberg S (1995) The Theory of Quantum Fields.