The Speed of Light is not the Greatest in the Universe!

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Abstract: By analyzing Maxwell's well known equation that proved the electromagnetic nature of light, we find that it contains an electron interacting with another particle with the same charge in magnitude (like or unlike) this interaction takes place at the nuclear diameter $2r_0 = 2.8x10^{-15} m.$. Maxwell's equation in its analytical form gives gamma ray energy of $1.023Mev$ for two electrons with opposite charges, where the speed of light c appears here ,but with greater gamma energies the distance between the two particles is shorter and accordingly the speed is greater. We applied the analytical form of this equation on gamma of 2.17 Mev used by Bethe in 1938 where he succeeded in separating a neutron from a proton in deuteron , the speed of the electron here exceeded that of light. This led us to conclude that the energy determined for breaking down the bind energy of helium nucleus according to S. theory of relativity , this determination must be strongly reconsidered, as it had been based on that nothing in the universe can travel faster than light.
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1-Introduction:

In fact this article had been written before I heard the news of breaking the speed of light by CERN scientists, where Antonio Ereditato the spokesman for the international group of researches announced that they have high confidence in their results which contradict Einstein's 1905 theory saying that the speed of light is a cosmic constant , and that nothing in the universe can travel faster [(1)]. The neutrino is that exceeded the speed of light in the experiments of CERN scientists, but here in this article the electron is the particle that exceeds the speed of light through analyzing Maxwell's equation that proved the electromagnetic nature of light.

2-Binding energy between Bethe and Einstein:

To separate a neutron from a proton in deuteron nucleus, Bethe used gamma ray of $2.17Mev$ energy in his experiment performed in 1938 [(2)]. In helium nucleus which is double the mass of deuteron (two protons + two neutrons) according to Einstein's special relativity where $E = mc^2$, total mass of a stable nucleus is less than the component protons and neutrons , thus when He is formed some mass is turned into energy, here mass defect is 28.30 Mev is required to overcome the binding energy of this nucleus [(2)], this result as it is well known based on the difference in masses between helium nucleus as a whole and the masses of its four particles. Einstein believing that the speed of light is the greatest one in the whole universe considered that it has the capacity of turning this amount of mass binding He completely into energy , with the mentioned experiment of Bethe where the speed of light was exceeded in gamma ray, the theory of S. Relativity with the speed of light according it must be reconsidered seriously .

3-The speed of light in an analytical form of Maxwell equation:

Maxwell wrote in 1865 saying that light is an electromagnetic disturbance propagated through the field according to electromagnetic laws [(4)]. This is a very accurate explanation to the phenomenon he discovered and described mathematically in the following celebrated formula.

$$c^2 = \frac{1}{\mu_0 \varepsilon_0} \quad [5] \qquad [1]$$

But without analyzing it we still see only the surface of the matter , I mean see the speed of light being equal the two constants of electricity and magnetism (permittivity and permeability) in space. Let us now open the locked box of this equation !

Dimensionally $\frac{1}{\mu} = \frac{e^2}{ML}$ and $\frac{1}{\varepsilon} = \frac{ML^3}{e^2T^2}$, their multiplication gives $\frac{L^2}{T^2}$

By analyzing one of the constants in the R.H.S numerically we find that

$$\frac{1}{\mu_0} = \frac{e^2}{4\pi} \frac{}{rm_e} = \frac{1}{4\pi x10^{-7}} \qquad [2]$$

e^2 refers to two fundamental reacting charges , and r is the distance between both of them, one of them is the charge on the electron's mass m_e, in eq 2, the other on a particle, being other electron or positron or even a proton (only the mass of electron appears here) From 2 we discover that the distance r is the basic known nuclear diameter $2r_0$ where

$$r = \frac{e^2.4\pi x10^{-7}}{4\pi m_e} = 2.8x10^{-15}\, m.$$

Therefore, the analytical form of Maxwell's equation takes the following form

$$c^2 = \frac{e^2}{4\pi} \frac{}{rm_e\varepsilon_0} \qquad [3]$$

Proving that the speed of light c is determined by r with its nuclear value $2.8x10^{-15}\ meter$, this means that light is basically a nuclear phenomenon and that our sharp distinction between electromagnetic and nuclear energies should be seriously reconsidered. From Maxwell's equation itself we can get the ***minimum*** energy of gamma from 3, as

$$2m_e c^2 = \frac{e^2}{2\pi} \frac{}{r\varepsilon_0} = 1.64x10^{-13}\ J = 1.023Mev$$

[4]

Where two electrons of two opposite charges form this minimum energy of gamma ray. But what about the greater energies of gamma which reach tens or even hundreds of million electron volts ? may it explained by the increase of mass with velocity according to S. Relativity where

$$m = \frac{m_0}{\sqrt{1-\frac{v^2}{c^2}}} \quad (6) \qquad [5]$$

According to this formula –as it is clear- when v^2 approaches c^2, then the value of the mass goes to infinity. But what the situation will be if v exceeds c as we will see now ?! from the analytical form of Maxwell's equation the masses of the two electrons in kilogram multiplied by c^2 resulted in the exact minimum energy of gamma ray, as it is the case in (4) In the Special theory of Relativity the mathematical formula often use the factor gamma which is defined by (5)

4-Exceeding c in gamma ray:

Now, to explain the energy of gamma exceeding this minimum value $1.023Mev$, the distance r between the two electrons with opposite charges must be less than the nuclear diameter inside this "opened" box of Maxwell's equation . In the case of the mentioned Bethe experiment where the separation of the proton from neutron needed $2.17Mev$ or $3.47x10^{-13}\ J$, then the distance between the two electrons forming gamma must exactly be the basic nuclear radius, and this can be proved by using the analytical form of Maxwell's equation (4) with this energy as follows

$$r = \frac{e^2}{2\pi\varepsilon_0 3.47x10^{-23}} = 1.32x10^{-15} \text{ meter} \qquad [5]$$

Can there be any doubt about this calculation based upon the equation which proved the electromagnetic nature of light (and now this electromagnetism appeared as the minimum level of nuclear energy) Here the speed of light exceeds the familiar one c where

$$v^2 = \frac{e^2}{2\pi} \frac{}{rm_e\varepsilon_0} = 3.83x10^{17} \qquad [6]$$

r in (6) takes its value from (5) , and accordingly this is the speed that gave this certain energy to gamma ray by which Bethe succeeded in his mentioned experiment, the energy needed to break down double this atom (helium nucleus) must be at least double this energy or slightly greater but not $28.30Mev$. If Einstein had analyzed Maxwell equation he would not probably put the principle that the speed of light c is the greatest in the whole universe!

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