ORIGIN OF MASSLESS PARTILES

Sarthak sourav Dash

October 2, 2017

Abstract

In this theory,we are going to describe how massless particles(photons,gluons) were originated just after bigbang.here i have done how a massive confined energy propagated and how it becomes any of the massless relativistic particle which travels at c speed.again i am going to describe ,what does emission of a photon really means.

1 Introduction

All the observable and non observable energy of this universe was confined in a tiny thing ,which is everything now.let us consider that when the universe started expanding,the particles went on in an accelerating manner.the space,time ,energy everything started.here we will consider only the positive energy which is in the form of matter(MASS) or kinetic energy ,heat,radiation and other positive energy.we will prove mathematically that how the accelerating particles became radiations.let us start.

2 Theory

Just after the bigbang, the confined or condensed energy started expanding in all directions.But where did it got kinetic energy to expand? the answer is it was a condensed form of energy,and the energy itself is added to itself in the form of kinetic energy to accelerate itself.In layman language it was the fuel of itself to accelerate itself .Continuously the mass(condensed energy) looses and became the kinetic energy in a small amount to go a small distance with a small added acceleration. According to the law $E = mc^2.R$ where R is the relativistic factor

$$\frac{1}{\sqrt{1 - \frac{v^2}{c^2}}}$$

where c is the speed of light ,v is the instantaneous speed $\frac{dx}{dt}$(x is the instantaneous distance covered and t is the time taken.

The small work done for the body happens when a small loss in mass occurs and the work done is connected to the loss in mass in the following manner .

$$dW = -dm.c^2R$$

now let us try the mathematics and get the result ,what happen to the moving body continuously loosing mass and gaining energy (kinetic energy) to go further.

3 Mathematics

As described above R is the relativistic factor

$$\frac{1}{\sqrt{1-\frac{v^2}{c^2}}}$$

.Now

$$dR = \frac{R^3 \cdot v \cdot dv}{c^2}$$

. Consider a small piece of confined energy of mass M and instantaneous mass m.it's relativistic mass will be

$$m \cdot R$$

.it's momentum

$$P = m \cdot v \cdot R.$$

. consider it's equation of the relation between the workdone by itself to accelerate itself ,

$$dW = -dm \cdot R \cdot c^2$$

$$\Rightarrow F \cdot dx = -dm \cdot R \cdot c^2$$

$$\Rightarrow \frac{dp}{dt} \cdot dx = -dm \cdot R \cdot c^2$$

$$\Rightarrow dp \cdot \frac{dx}{dt} = -dm \cdot R \cdot c^2$$

substituting for p and for $\frac{dx}{dt}$

$$\Rightarrow d(m \cdot v \cdot R) \cdot v = -dm \cdot R \cdot c^2$$

$$\Rightarrow (mvdR + mRdv + vRdm) \cdot v = -dm \cdot R \cdot c^2$$

$$\Rightarrow (mv \cdot \frac{R^3 \cdot v \cdot dv}{c^2} + mRdv + vRdm) \cdot v = -dm \cdot R \cdot c^2$$

canceling R of both sides

$$\Rightarrow (m \cdot \frac{v^2 \cdot R^2}{c^2} \cdot dv + mdv)v + v^2dm = -dm \cdot c^2$$

substituting R^2

$$\Rightarrow (\frac{\frac{v^2}{c@}}{1-\frac{v^2}{c^2}} + 1) \cdot mvdv + dm \cdot v^2 = -dm \cdot c^2$$

$$\Rightarrow (\frac{c^2}{c^2 - v^2})mvdv = -dm(v^2 + c^2)$$

$$\Rightarrow \frac{vc^2dv}{(c^2 - v^2)(c^2 + v^2)} = -\frac{dm}{m}$$

$$\Rightarrow \int_0^V \frac{vc^2dv}{(c^2 - v^2)(c^2 + v^2)} = -\int_M^{M'} \frac{dm}{m}$$

$$\Rightarrow \frac{1}{2} \cdot \int_0^V \frac{vdv}{v^2 + c^2} - \frac{-vdv}{c^2 - v^2} = -[lnM' - lnM]$$

$$\Rightarrow \frac{1}{4} \cdot (ln(v^2 + c^2) - ln(c^2 - v^2)) = ln(\frac{M}{M'})$$

$$\Rightarrow ln(\frac{v^2 - c^2}{v^2 + C^2})^{\frac{1}{4}} = ln\frac{M'}{M}$$

with drawing log from each side.

$$\Rightarrow M' = (\frac{c^2 - v^2}{c^2 + v^2})^{\frac{1}{4}} \cdot M$$

consider the factor $(\frac{c^2 - v^2}{c^2 + v^2})^{\frac{1}{4}}$ is S . so$M' = M \cdot S$. Here is the final equation making a relation between the speed the body gains with the resultant mass.hereM' is the final mass of the particle and$V$ is the speed of the body.As we have taken the tiny sphere of condensed energy as the frame of reference,we can say that the body was at speed 0 when the mass was unaccelerated. The kinetic energy of the body is the lost mass , means $(M - M') \cdot c^2$. now putting the value ofM' ,we get$kineticenergy = (M' = M \cdot S) \cdot c^2$.

4 physical Analysis

As the particle starts accelerating , mass in it starts increasing and decreasing simultaneously due to the relativistic factor and due to the conversion of mass to energy.Now when we put 0 in the variable V we will get the final mass is equal to the rest or starting mass.Now as the particle goes on, the simultaneous change in mass occurs due to two different factors.But if u observe the final equation the decreasing actually dominates the increasing. A significant result will be observed if u put C in the velocity variable.the whole mass of the particle will be zero and if u put the same result in the formula for kinetic energy,it will be obtained Mc^2 .Does this make any sense? Yes, there are massless particles like gluons , photons and gravitons. And if the object stops accelerating just before reaching c , they will be some relativistic particles ,but without charge as the net charge in the universe is zero. The particles with zero mass means the particles do not interact with the higgs field.but what if we put a value greater than the speed of light,we get that the its mass will be imaginary ,we can only imagine that,we cant get any real significance.of that mass. This again says that even a body loosing its own energy and accelerating itself also cant go more than C.hence the condensed mass will be accelerated and there will be obtained a photon.now after making a photon,the photon can be converted into a number of photons r it can be converted into a pair of particle and antiparticle of zero mass but having interaction with higgs field. When an electron emits a photon,loss of mass energy and converting into a mass less particle sound weird, so this says about the intermediate stage of leaving a condensed massive particle and ,as it is unstable in pure stage at normal conditions,that becomes a photon.or any particle in the universe. emission of anything happens in this way.if you put mass of a relativistic particle,you can get the speed of it in pure space.

the wavelength of the photon or gluon depend upon the rest mass M.

5 Conclusions

This is how a photon or gluon is made from the condensed mass and how a gluon is formed.This theory says only about the intermediate stage of what happens and what we see.after a short while