Wave particle and luminiferous aether trinity of the light

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Paper 2

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Abstract

Speed of light in the past was slower than present

The speed of light in vacuum is constant at all time and is equal to $C=3x10^{8}ms^{-1}$, but the yard stick that is measured in is shorter in the past than present due to the density or the temperature of the space or the CMB. In the past the space was hotter and the CMB photons were of shorter wavelength compare to the present epoch that space has stretched or expanded making the yard stick longer.

The consequences of the above interpretation of the vacuum of space will give rise to the illusion that the speed of light has been slower in the past and hence suggests that the speed of light depends on the quality of the vacuum that is travelling through or according to *James Clark Maxwell* [1] relative to the luminiferous aether background.
Furthermore the propagation of light in vacuum would be transfer of energy by completely elastic collisions through the medium of the CMB photons and hence the ghostly photons of the CMB are the medium in which the electromagnetic radiation propagate with the collision rate that is the frequency of the electromagnetic radiation which in turn the speed of light through the vacuum depends on the size of the wavelength of the CMB.

The above approach will replace the Dark Energy with the CMB photons that are the missing mass in the Universe as well as the force of the expansion in the Universe.

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Introduction:

The speed of light depends on the properties of the medium like the vacuum (vacuum with permittivity ε_0 and permeability μ_0) by the famous formulae:

$c = \sqrt{\frac{1}{\mu_0 \varepsilon_0}} = 2.99792458 \times 10^8 ms^{-1}$ The speed of light in free space.

Hence the light reaching us from a galaxy at Z=1 with a co-moving distance of

$CMD = 8.4467 \times 10^9 Years$ approximately 2591 Mpc has taken $12.67 \times 10^9 Years$ (3886.5 Mpc Light travel time or the luminosity distance) to reach us which makes the Universe over 25 billion years old.

This interpretation of the space will result in two values of the Hubble constant, one for the expansion of the space or the opening of the space (Inflation, creation of more space or expansion of radiation) at $H_{0R} = 77.13 KmS^{-1}Mpc^{-1}$ giving apparent age of the universe at about at about $12.67 \times 10^9 Years$ and the other the expansion of galaxies in the universe at $H_{0m} = 38.565 KmS^{-1}Mpc^{-1}$ giving the age of the universe at about $T_{0m} = 25.3425 \times 10^9 Years$. (In 4 separate papers by the same authors full details are given).

The time dilation and the γ factor the (**Lorentz factor** $\gamma = \frac{1}{\sqrt{1-\frac{v^2}{c^2}}} = \frac{1}{1-\beta^2} = \frac{dt}{dr}$

Dutch physicist Hendrik Lorentz (18 July 1853 – 4 February 1928) which assumed using Minkowski's (1864 – 1909 union of the three space and one of time) four dimensional space-time mathematics to predict time dilation and γ as a function of velocity. At low velocity the value is 1 and as the velocity approaches the speed of light, the value will increases to infinity $(\gamma \to \infty)$ and the time will be

$\Delta t' = \frac{\Delta t}{\sqrt{1 - v^2 / c^2}}$ this means that for moving observer the period of the clock is longer and can approach infinity.

The above infinities (∞) can be removed by approaching the idea of **James Clerk Maxwell** FRS FRSE (13 June 1831 – 5 November 1879) Scottish[1] scientist, who suggested that the vacuum of space is made up of the luminiferous aether and the

speed of light depends on the properties of this medium (vacuum with permittivity ε_0 and permeability μ_0) by the famous formulae:

$c = \sqrt{\frac{1}{\mu_0 \varepsilon_0}} = 2.99792458 \times 10^8 \, ms^{-1}$ The speed of light in free space.

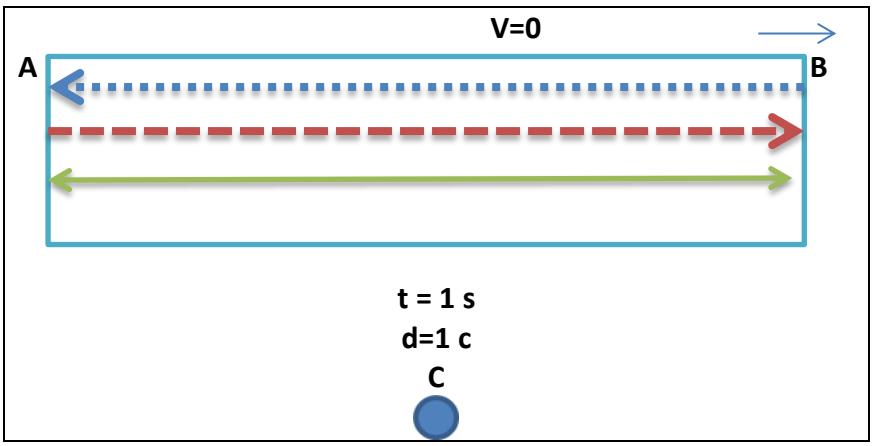
In materials with relative permittivity, ε_r , and relative permeability, μ_r , the phase velocity v_p of light becomes: $v_p = \frac{1}{\sqrt{\mu_0 \mu_r \varepsilon_0 \varepsilon_r}}$ which is usually less than *c*.

In this paper a new approach to vacuum of space using Maxwell's aether has created some interesting results that might help resolving some problems in physics and cosmology.

Text

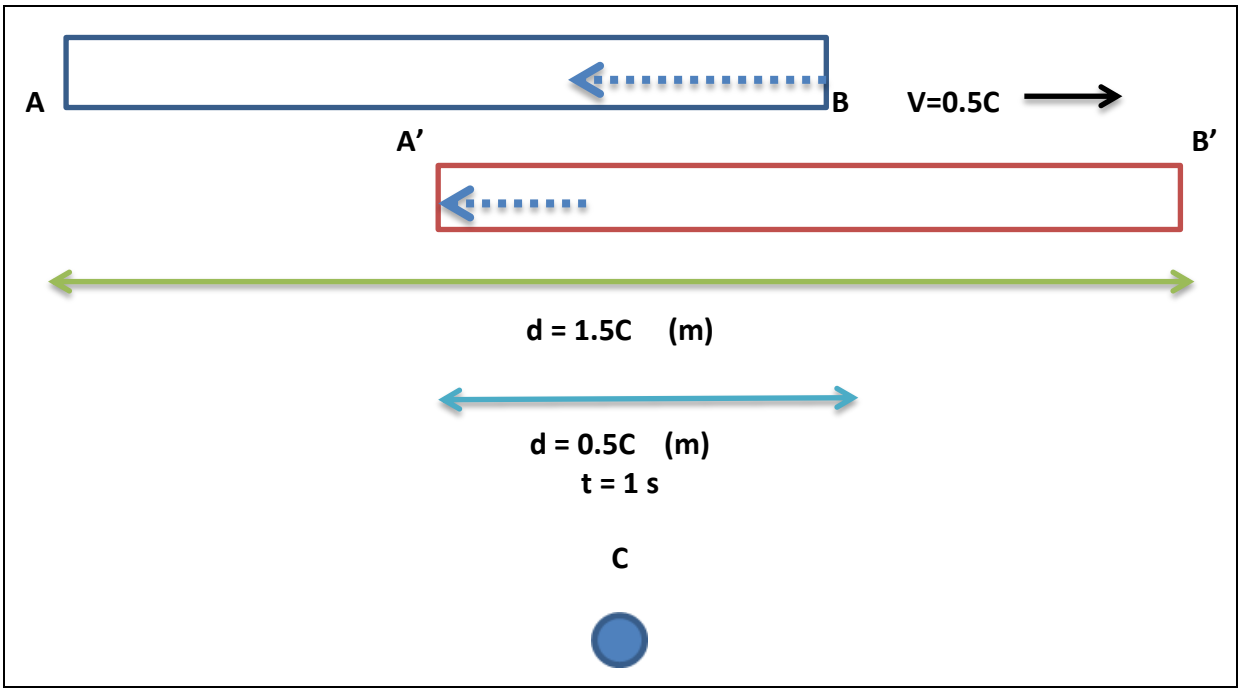
The thought experiments in fig 1.1 to 1.5 shows that the relative movement of light in the vacuum of space is completely different to the movement in confined closed train that the train and the vacuum space inside the train are moving with the respect to the space outside(aether) and the Galilean transformation is the correct transformation rather than the Lorentz transformation (even at relativistic speeds) and the three dimension of space is not embedded to the dimension of time which is a Universal Newtonian time.

Fig 1.1 Train is stationary



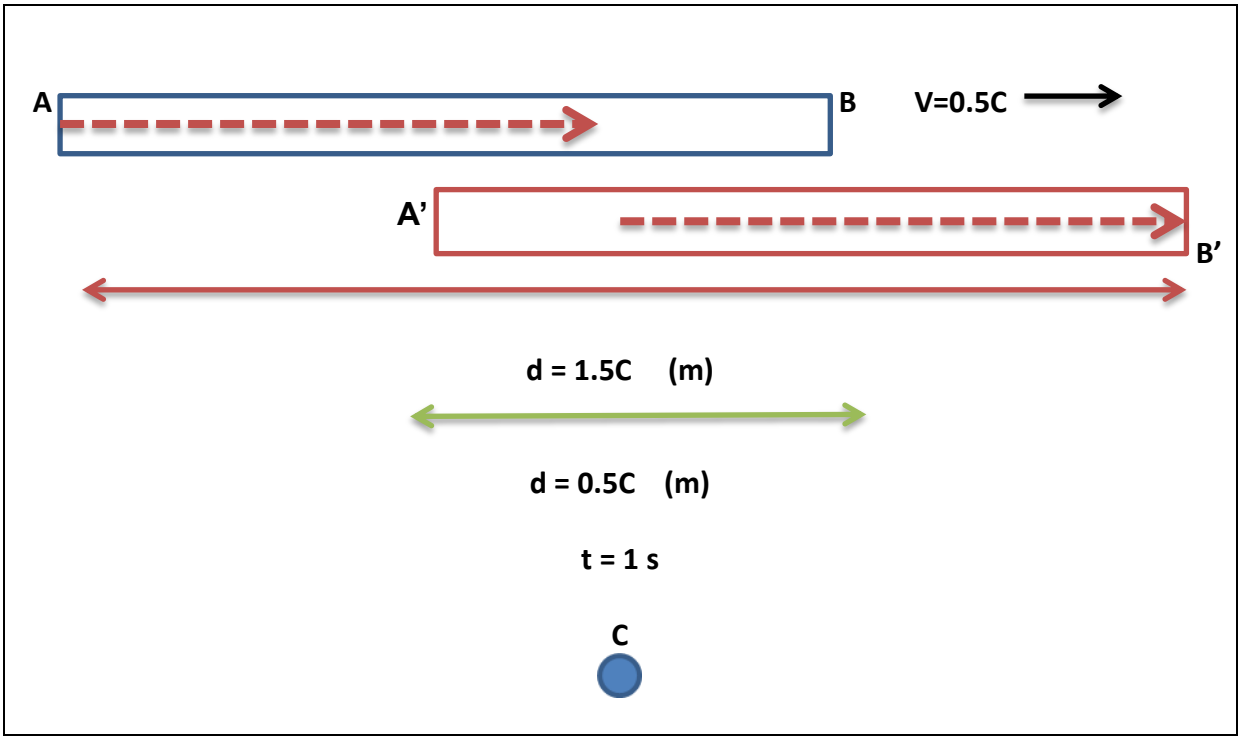
Observer **C** will see the light from passenger **A** and passenger **B** reach each other in 1 second.

Fig 1.2 Train is moving with V=0.5 C



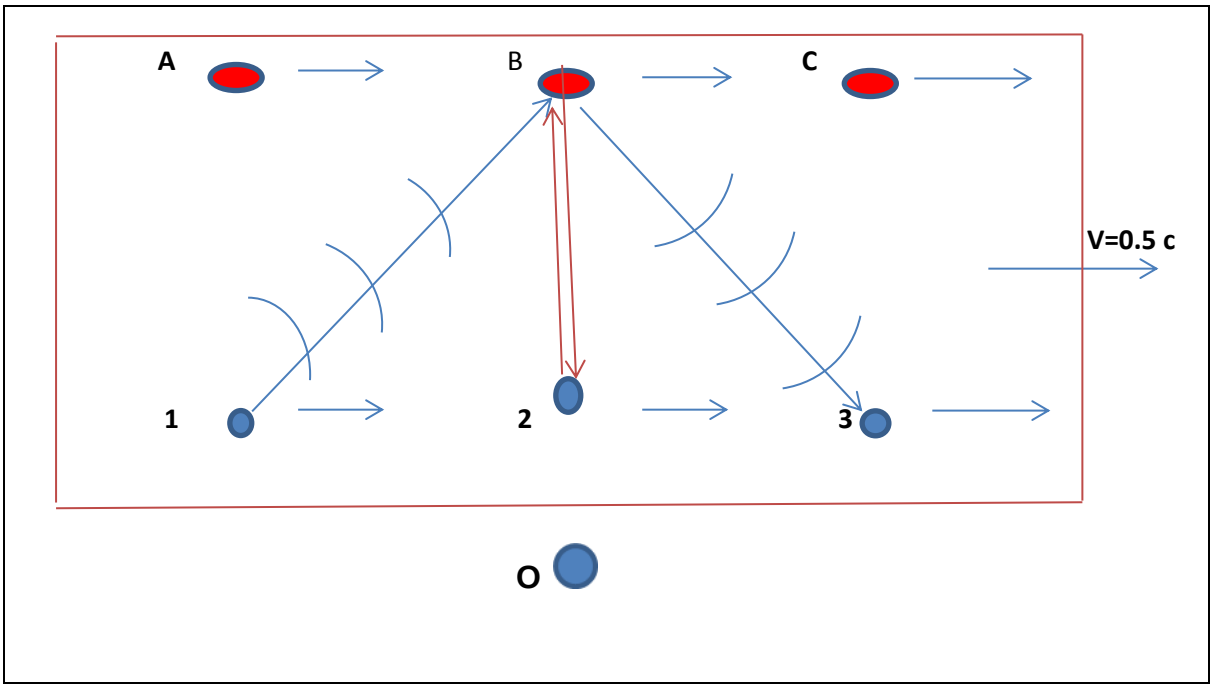
Observer **C** will see that in 1 second light from passenger **B** has travelled 0.5 c distance to reach passenger **A**.

Fig 1.3 Train is moving with V=0.5 C



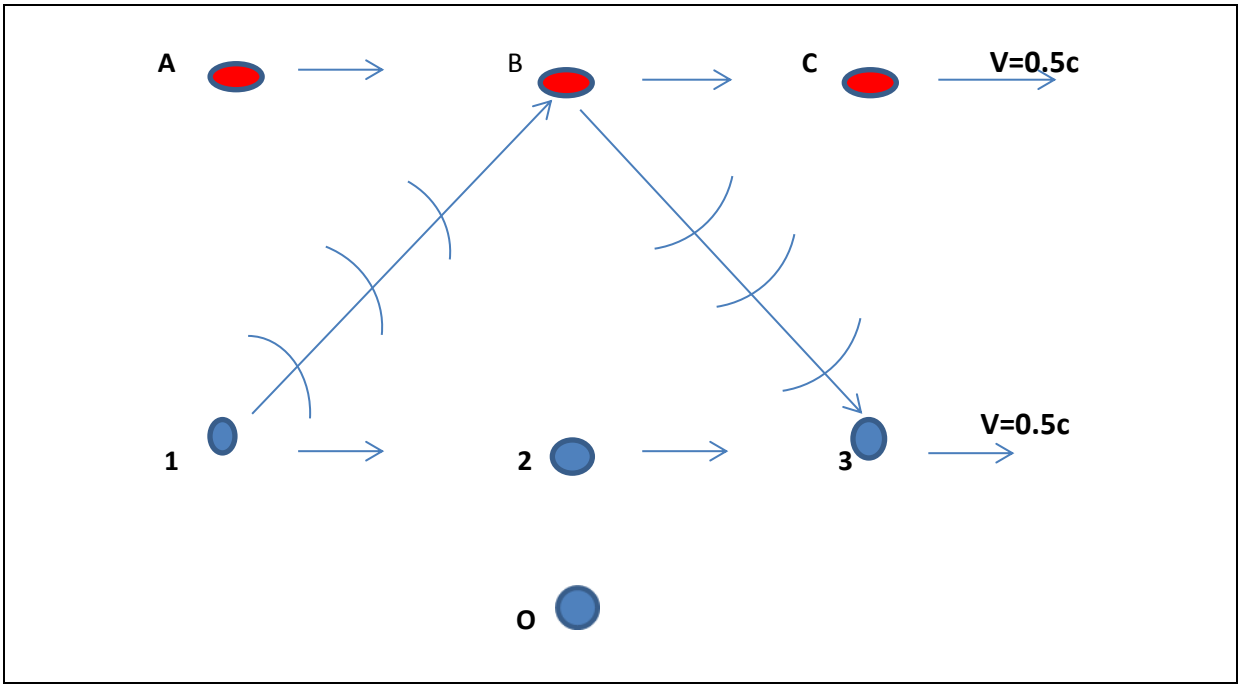
Observer **C** will see that in 1 second light from passenger **A** has travelled 1.5 c distance to reach passenger **B**.

Fig 1.4 Train is moving with V=0.5 C



In the above the distance between the astronaut and the mirror is 0.5c and the astronaut and the mirror are both in the train and the train is moving with the speed of 0.5c, the observer **O** is stationary and observes the light has travelled longer distance in 1 second than the C metre but the astronaut will record the light has travelled c metre in 1 second. In this case the vacuum of space in the train is also moving relative to the space outside the train.

Fig 1.5 the astronaut and the mirror above the astronaut are moving with V=0.5 C through vacuum of space.



In the above the distance between the astronaut and the mirror is 0.5c, the astronaut and the mirror above the astronaut are travelling in vacuum with the same speed V=0.5c and as the light travels upward from position 1will reflect at B and reach the astronaut in position 3, the light has travelled a distance greater than 1c in a time larger than 1 second. Therefore the observer **O** will record the same time and distance as the astronaut.

In this paper the propagation of the electromagnetic radiation has been considered to be the quanta of energy through any medium including the vacuum of space which consists of an aether medium.

In addition the electric field **E** and magnetic field **B** are mutually perpendicular to each other and to the direction of the propagation.

The luminiferous aether has been considered to be the ghost particles or the ghost stationary photons (quantum gravity, graviton, God particle or Planck's particle).

Fig 2.1 to 2.3 shows the spherical ghost photon as the aether background and the way the energy is transferred creating electric and magnetic fields.

Direction of propagation or momentum (energy) transfer of the electromagnetic radiation.

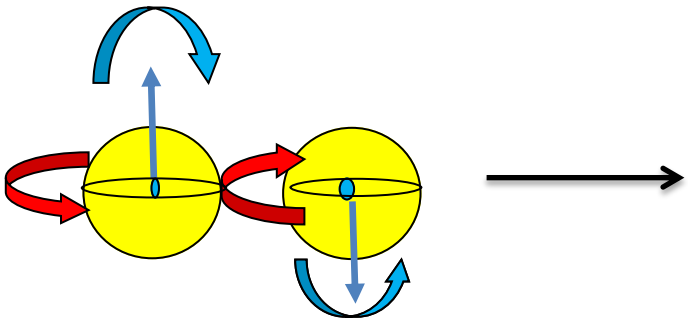


Fig 2.1 When the rotation is anticlockwise the direction of the magnetic field is upward and when energy transfer by electric field is clockwise the magnetic field is downward.

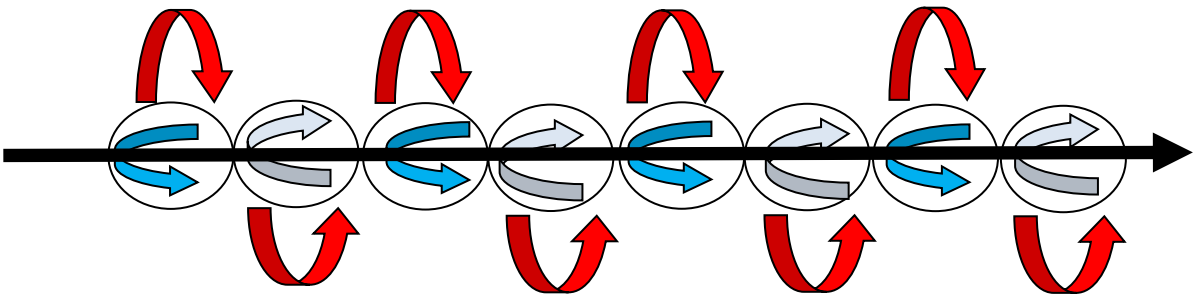


Fig 2.2

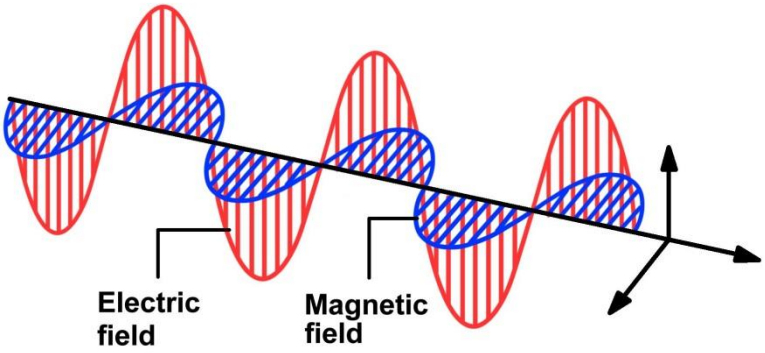


Fig 2.3 The propagation of light with magnetic and electric fields perpendicular to the direction of the propagation or energy transfer.

In the experiment that was carried out in the Lambeth College physics lab, a heating element was placed in the vacuum chamber where a laser light was directed passing on the side of the heating element and as the temperature of the heating element increased to about 500 to 600 **K** the spot image of the laser on the target moved towards the element (see pic 1 and fig 3).

In the experiment the angles of deflection follows the Snail's law and an angle of $\theta = 2'$ arc min was measured.

Einstein predicted that gravity or energy warps the space, one of Eddington's photographs of the total solar eclipse of 29 May 1919, presented in his 1920 paper announcing its success, confirming Einstein's theory that light "bends" near gravitational fields or massive bodies such as stars.

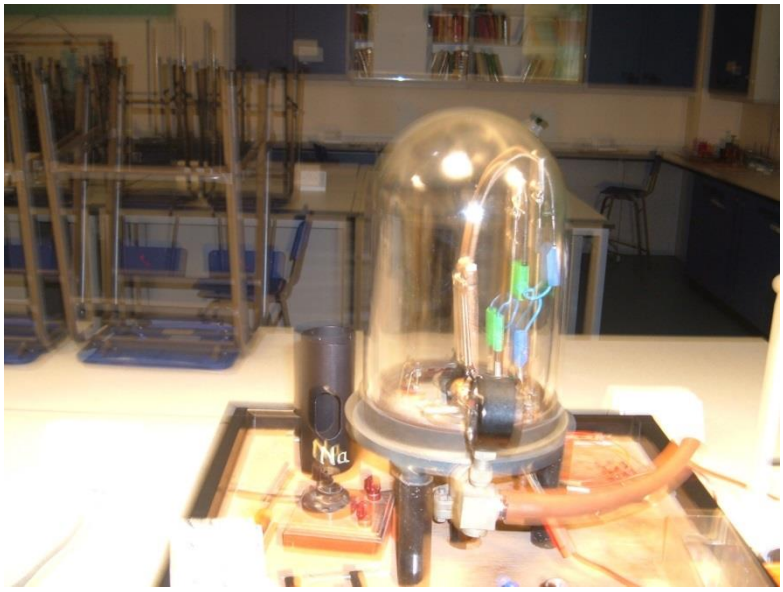
In this experiment the energy in the vacuum chamber has warped the vacuum of space with the angle $\theta = 2\alpha$ for entering the boundary and exiting the boundary.

The angle that **Sir Arthur Stanley Eddington** OM FRS[2] (28 December 1882 – 22 November 1944) measured was double the angle that Einstein originally calculated using the gravity of the sun and added the factor of two afterward.

Einstein's first calculation only gave half the angle of deflection and then he added a factor of two to correct it to the experimental value measured by Arthur Edington.

In the experiment that was carried out in the vacuum in the physics lab the angle is two deflection one after the other.

Lab Experiment of energy deflecting light in vacuum



Pic 1 the heating element and the laser light inside the vacuum chamber.

Angle $\theta = 2\alpha$ angel α is the first and second deflection of light giving a total of 2α and this is the due to the vacuum having a higher density near the heating element and lower density further away decreasing by inverse square law.

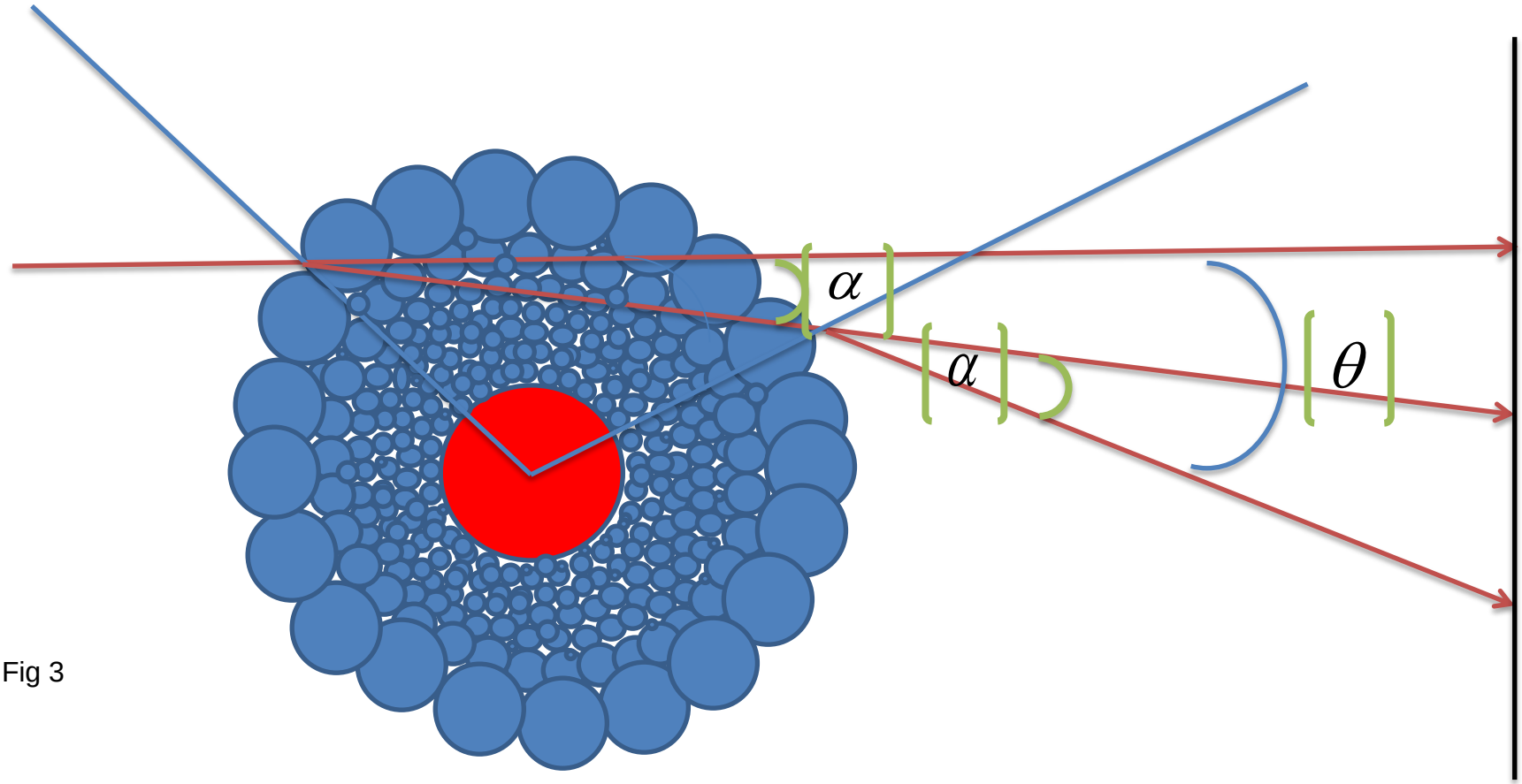


Fig 3

The direction of the laser light due to the heating element in the centre, the deflection angles at two stages as Snell's law giving a total angle . θ

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Albert Einstein Discredited the concept of a "luminiferous aether" and did not connect the ability of gravity to "bend" light to the property of space as the Maxwell's equations shows the speed of light depends on the permittivity and permeability of the space or the vacuum which is the luminiferous aether and is this vacuum that has different density at different temperature.

The photons of the Big-Bang are the space in this universe and in the past with higher temperature will show an apparent slow velocity of light than the vacuum today with lower temperature due to the size of the length of the yard stick.

The above phenomena is the cause of light taking much longer time from distance galaxies to reach us than the present distance (co-moving distance) and the luminosity distance appears much larger than present distance (co-moving distance). (see paper 3 on the Hubble constant and the age of the Universe by the same authors).

This phenomena has also been discussed in the paper 4 by the same authors

(The time prior to the Big-Bang) and will shed some light on some other unsolved problems in cosmology.

Double slit experiment in vacuum

The double slit experiment in vacuum is the best way to analyse the photon background in the vacuum which allow the energy transfer to take the wave and particle duality phenomena through this ghostly luminiferous background.

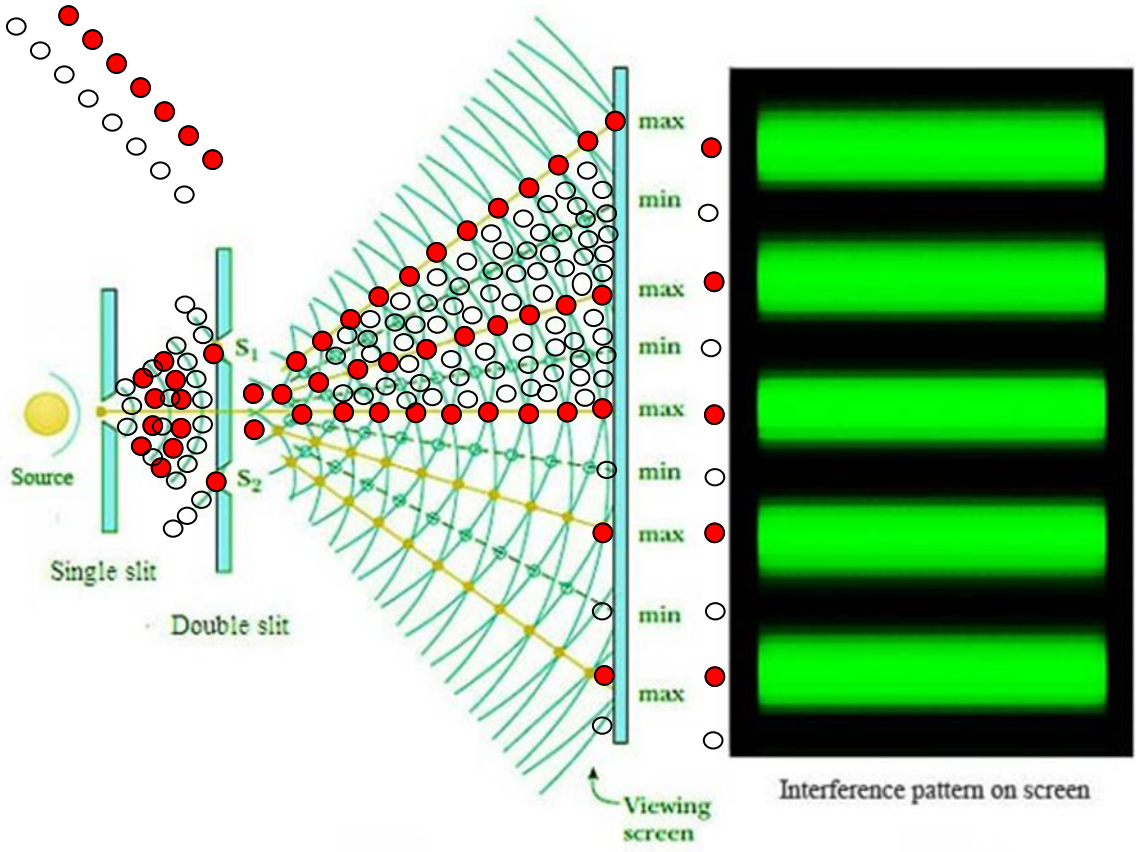

Fig 4

In this figure half the diagram displaying the photon background in vacuum some are carrying the energy and transferring to the next photon in completely elastic collisions as individual particle and at the same time in a wave propagating and a drop in the intensity by inverse square law.

Conclusion

With the thought experiment it is proven that the Galilean transformation is the correct transformation and the Lorentz transformation is not the true or correct way of interpreting the movement of light in the moving frame of reference (the vacuum or aether background).

In the paper 4 by the same authors (The time prior to the Big-Bang) the dark energy or the force behind the expansion of the Universe is associated with the photons of the Big-Bang (CMB) and produces some interesting results regarding the Hubble constant (paper 3 by the same authors Hubble constant and the age of the Universe) and the unification of the electromagnetic force and quantum of gravity (paper 1 by the same authors Unification of the electromagnetic force with quantum gravity).

References

1) ^ *"James Clerk Maxwell". The Science Museum, London. Retrieved 22 April 2013.*
2) *Plummer, H. C. (1945). "Arthur Stanley Eddington. 1882-1944". Obituary Notices of Fellows of the Royal Society. **5** (14): 113–126. doi:10.1098/rsbm.1945.0007.*
3) http://www.sciencemuseum.org.uk/onlinestuff/People/James%20Clerk%20Maxwell%20183179.aspx [Accessed 23 August 2016].
4) https://en.wikipedia.org/wiki/Max_Planck [Accessed 7 August 2016].