

Effect of Photon Inside a Light Ray on a Magnetic Field

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Abstract:- When the word Light comes to our mind we feel which gave us power to see different objects around us. We see due to presence of light. If there is no light we lost the power to see object around us in fact it becomes completely dark. With many advancement of Science many scientists studied the characteristics of light. Some of them light always travel always in straight path and especially the principle of reflection and refraction of light. The light interacts different to different ways material to material wise and when light passes from one medium to other it bends to its normal axis. Here we study about characteristics of light ray on a strong magnetic field. Earlier it was believed that earth was flat and sun used to revolve around the earth. Great scientist like Nicolaus Copernicus and Greek philosopher disregarded this and proved that the earth is round and earth revolves around the sun. Light is considered to be travel in a straight line. If we quantify this thing we will conclude that nothing travels perfectly straight in this world. As Light rays consists of photons and travels in electromagnetic wave Theory suggests that that light always travels in a straight line. If light follows through a straight line it means that its gradient is zero. If we properly analyze the Bohr atomic and Schrödinger wave mechanical model we will find the gradient can't be zero. According to Bohr Atomic model when electron jumps into higher orbits it gains energy and when it drops from higher orbit into lower orbit it releases energy it is mainly difference in energy between different orbits so gradient can never be zero and according to the wave mechanical model of Schrödinger when light releases energy it releases energy in the form electromagnetic wave. When light follows through a medium it gets disturbed through a medium due to dissipative effects. Light can gain energy from the medium and can lose energy. Here we provided an extra energy to the light ray and studied its consequence and we have put down lot of theories regarding the quantum mechanics law for proper analysis of our study on light ray and effects on external supply of energy to the light particle.

Keywords:- Light ray; photon; magnetic field; electromagnetic wave.

I. INTRODUCTION

Light ray interacts different way material to material wise and its characteristics changes depending on some condition. When light interacts with something its intensity

gets altered. When light gets reflected the frequency and wavelength of light ray remains the same but intensity gets changed. Light is actually flow of photons. When light travels through a medium the intensity of photons gets changed. The main of our experiment is to bend the light by providing some extra energy to the light ray and bend its path.

A. Quantum entanglement

Entanglement is the property which makes quantum mechanics different from classical mechanics. In both classical mechanics and quantum mechanics one can define a pure state as a point in phase space [1][2]. In quantum mechanics the vector is in a complex vector space. The most important feature of quantum mechanics is that for the composite system there exists a pure states of the system there exists pure system in which parts don not have pure states of its own. Such states are called quantum state. According to Scolarici and Solombrino. The essential difference between quantum mechanics is clearly identified by the phenomenon of entanglement. Entanglement plays very key roles in all controversial features of quantum mechanics are proposed. Entanglement plays a crucial role in identify, quantify and classify.

B. Copenhagen interpretation

The copenhgen interpretation was the first attempt to understand the world of atoms as this is represented by quantum mechanics. The founding member was mainly Danish physicist Neil's Bohr but also Werner Heisenberg and Max born who made overall contributions to the quantum world. Both Bohr and Heisenberg never totally understand the mathematical formulism of quantum mechanics and neither of them ever used the term "Copenhagen Interpretation" [10]. After Heisenberg managed to formulate a consistent quantum numbers, both he and Bohr struggled to find coherent interpretation of the mathematical formalism. When Heisenberg looked into the formalism he developed his own uncertainty principle. Bohr was close to analyze the concrete experimental arrangements. Bohr chose to analyze experimental arrangements especially the double slit experiment. At Common he presented his ideas according to which different descriptions are said to be complementary. So within 8 year Bohr abandoned wave-particle complimentary and favored "kinematic-dynamic" complementary. He proposed his interpretation known as copenhgan Interpretation it states that it doesn't exist one state or another and one particle is forced to choose one

probability and the state that we observe. As it forced out of the different observable state each time, this is why quantum particle behaves erratically. The essence of quantum entanglement was recognized by Einstein, Podolsky, Rosen, and Schrödinger. Entanglement considered to be non-classical manifestation of quantum formalism, was used by Einstein, Podolsky, and Rosen in attempt to ascribe the values of physical qualities prior to measurement. It was Bell who showed opposite to EPR that the entanglement which irrevocably rules out such a possibility [3][4].

C. EPR Paradox

The EPR Paradox (or the Einstein-Podolsky-Rosen Paradox) is thought experiment intended experiment to inherent paradox in the early formulations of quantum formulation which is the best example for quantum entanglement. The paradox involves particles which are entangled with one another according to quantum mechanics. Under Copenhagen interpretation of quantum mechanics each particle is at uncertain state until it is measured at which point the state of the particle becomes certain. The other particle also becomes certain. The reason it is referred as paradox as there is communication between two particles as it involves communication between two particles at speed greater than the speed of light [5][6]. Which is in a conflict with Einstein's theory of relativity? The paradox was the focal point of the debate between Albert Einstein and Niels Bohr. Einstein was not very comfortable with the quantum mechanics developed by Bohr and his colleagues. Together with his colleagues Einstein developed EPR paradox which is very inconsistent to other laws of physics.

Seven years later David Bohm formulated the EPR paradox. An unstable particle O decays into two different particles particle A and particle B heading to different spin. The initial particle has a spin 0; the sum of new particles must be zero. If a particle has $+ \frac{1}{2}$ spin then other particle should have $- \frac{1}{2}$ spin. According to Copenhagen interpretation of quantum mechanics, until there is any measurement neither particle is made. They are both in a superposition of possible states with equal probability of having positive or negative spin [7][8].

D. Schrödinger's Cat Paradox

Schrodinger is thought experiment sometimes referred to as thought experiment. It illustrates the problem what he saw in the problem of the Copenhagen interpretation of quantum mechanics applied to everyday objects. Schrodinger is best known for his work regarding the quantum theory and particularly about his thought experiment involving a cat in order to explain the flawed interpretation. The thought experiment involves a cat placed in sealed in a container along with Geiger counter, a vial of poison, a hammer, and a radioactive substance. When radioactive substance decays Geiger detects it and trigger the hammer to release the poison. The radioactive decay is random process and so nobody could predict it what will happen to fate of the cat

whether he would live or die. Physicists say that atom exists in superposition state both decayed and not decayed. Until the box is opened an observer doesn't know whether the cat is alive or dead. Until the container remains unopened the cat would remain in the state of zombie state of being both alive and dead. But the quantum superposition will not work for large objects such as cat. Schrödinger supported the thought of the experiment but really he did not. Modern experiments have revealed that quantum superposition works for electrons, large objects must be regarded differently [9].

E. Quantum teleportation

In quantum teleportation the properties of quantum entanglement are used to send quite between observers without physically moving the involved particle. The particles are not really teleported but their states get destroyed at one end and get extracted at the other end. The quantum information teleportation depends on communicated classically between the observers. The quantum teleportation may be used to teleport quantum information to large distances.

F. Photons

Ever since the 1920 photon has been used synonym for light quantum. Later photon became elementary particle as electron, proton and the neutron. The origin and early developments of photons is in the sense of localized quantum of electromagnetic radiation. Einstein proposed the free monochromatic radiation of frequency ν which is composed of "energy quanta" given by $E=h\nu$. The early development After Einstein developed his own theory by assigning the momentum of $p = h\nu/c$ to light quantum. The light has dual nature particle and wave nature. Particles of light are referred to as photons. Photons are always in motion. As per Einstein's light quantum theory photons have the energy equal to their collision equal to their oscillation frequency times the plank's constant They are known as bosons as they have spin of -1. They don't have electric charge and they are destroyed and created by natural process. Recently Chinese scientists teleport photons into the space by quantum teleportation.

II. EXPERIMENTAL PLANNING

➤ Time

Time is an important parameter in human life, only time can be change the position or situation in the world, In the world, time cannot measure by numerically but for the help of calculation we can use numerical value. Because in the number system (0,1,2,3,.....9) we cannot reach the exact point of those values, for example (0.9) after that mathematically (1) will be came but originally (0.99), from here time cannot be denoted by decimal number, and the calculation should be more complex, for avoiding this kind of problem we are denoted time by real number. Real number existing but we cannot reach the exact point by the number line.

III. RESULTS

A. Human Mind

Every device takes any kind of energy and give some another kind of energy as an output. For an example in IC engine heat energy converted into mechanical energy, in a motor electrical energy converted into mechanical energy, on the other hand, in heat pump mechanical energy converted into heat energy, and in the dynamo mechanical energy converted into electrical energy, from this kind of example we can also say that teleport is a device which can converted an electrical energy into smart energy.

B. Smart Energy

Smart energy is a kind of energy where energy is converted into mass, this kind of output energy is called Smart Energy.

Smart energy means that if we applied a proper velocity on a body which is equal to the square of light velocity then the total mass will converted into smart energy. From here we can say that the amount energy produced from it which is very huge amount and we cannot use and measure it, because the smart energy is the product of mass and velocity of light, and the velocity of light is very high it cannot be This concept had been first established by the great scientist Einstein by the equation $E = mc^2$, here E denoted the total energy or smart energy, m denoted mass of the body, and last but not the least c stands for velocity of light. On the other hand Sir Einstein also said that light has constant speed, but there is a drawback, light's speed depends on its medium, and intensity of light mainly depends on its frequency. Every particle should possess some energy to flow. In case of light, photons should have enough kinetic energy to travel. When light travels it loses kinetic energy and intensity of light becomes less. That's why the light can't travel infinite distance with low frequency.

C. Law of Photonics

Light ray doesn't travel infinite distances directly, they have lost their kinetic energy, this lost is known as photonics loss, after that when the light ray totally lost its kinetic energy then they used its potential energy and create a loop so that photons try to return to its equilibrium state (with same intensity at initial), this phenomenon is known as Law of Photonics.

According to the law, we understood that the speed of light is depending on its intensity, and the intensity is totally depending on kinetic energy of the photons and the distance travelled by the photon because the intensity of light is inversely proportional to the square of the distance machine. From this statement if we change the light speed then only we can teleport, after that if we increase the light's intensity then we could see the future, and on the other hand if we decrease the light's intensity then we could see the past time.

To increase the intensity of light means that to put additional kinetic energy externally to the photon, then the photons will excited ,from here the photon will move with the speed which is equal to light's speed. But sunlight have come to earth properly to travelling the distance 149.6 million km due to its intensity, that is 1050 W/m^2 . If we incident a light ray with high amount of intensity or nearly equals to sunlight then the light ray would be able to travel long distance but could not be able to infinite distance traveled.

On the next way when the intensity of light will decrease, that means to create an obstacle on the way of light, and create disturbance also, then the speed of light will disturbed, by this the photon will move slower than the speed of light.

Let us consider, intensity of light= I , and distance travelled by the light is d , Then, $I = 1/d^2$, So form the above quotation if we are disturbing the photons then the kinetic energy of the light will decrease from there the intensity of the light will also decrease, by that time the speed of light must be changed, and our target is that, to change the light's speed for teleportation, Teleportation does not mean that to see the future time, it also means to see the past time. It also can use for time.

D. Equation

When a light ray will be travelling then some parameters will be affecting to it, which is gravity, friction of atmosphere, and refraction by medium, by those parameters should be responsible for losing the kinetic energy of the light ray.

Let us assume that kinetic energy of light ray is $L_{K.E}$, potential energy of light ray is $L_{P.E}$, and the loss by gravity is L_G , and loss due to friction of atmosphere is L_A , loss due to refraction by medium is L_M , The summation of the all losses must be equals to the kinetic energy of the light ray,

$$\text{So, } L_{K.E} = L_G + L_A + L_M; \quad (\text{Here the } L_{P.E} = 0)$$

After that the potential energy must be depending upon the losses. And also the responsibility to decreasing the intensity of light ray would be depending upon the above loss

E. Experiment



Fig 1:-Magnetic coil (we have made for this experiment)

Material used	Copper (Cu)
Length	31.5 cm
Diameter	2 cm
Input charge	220 volt, 50 Hz
Output (Radiation)	1760 volt

Table 1. Specification of the magnetic coil

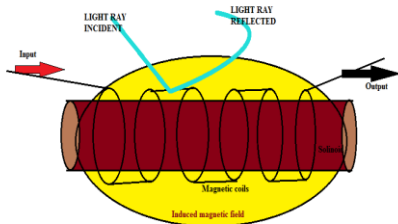


Fig 2:- Diagram of the experiment

IV. DISCUSSION

We have taken a strong magnetic coil especially which would be able to induce a strong magnetic field, after that we have incident a light ray on the surface of magnetic coil, then the light ray will bend by the disturbance of magnetic field, light always followed through a straight path but here it would take curve path because of disturbance of photon which has kept in magnetic coil. Due to oppositely charged particle will be creating disturbance to the light ray. And also hamper the velocity of the light ray.

➤ Experimental data

Here we gave input current is 220 volts, and frequency is 50 Hz. For the Tesla coil the frequency will be $50 \times 8 = 400$ Hz,

Now let us assume that we have projected a red light ray which has wavelength 680 nm that is 440871261.764706 MHz. And now let us assume that we have projected a violet light ray which has wavelength 410 nm that is 731201117.073171 MHz.

So the two different frequencies coincide to each other and the result will be affected to the light ray. So the light ray hampered and the light ray has changed its gradient value so the path must be changed from here. For this incident the light ray will be followed the curved path. Now the light ray would be able to bend itself, the reason behind it is the magnetic coil frequency is less than the light ray's frequency. On the other hand if the frequency of magnetic coil will be greater than the frequency of light ray then the light ray should be loss its kinetic energy. At that point of time we would not be able to see the light ray after projecting on the surface of magnetic field.

V. CONCLUSION

When we had passed the light ray very closed to the charged magnetic coil then the light was affecting and would not be able to maintain its gradient's value. Because the photons were

affected by the magnetic field, for this reason light rays could not be able to travel straight path on the earth. Earth has strong magnetic field as well as a strong gravitational force that's why the light ray must be followed curved way. Unfortunately this incident could not be able to see in normal way. The changes have very small value.

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