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Possible double slit and delayed choice quantum eraser experimental explanations

Abstract: Here, I use extracts from the McMahon field theory to explain how the McMahon field theory can be used to explain the mystery of the double slit and delayed choice quantum eraser experiments. It explains how fast moving electrons move as coils due to Einsteins length contraction, and how fast moving electrons are able to exist in many locations at the same time because of Einsteins time dilation.

Theory:

Special relativity applies to particles or masses moving close to the speed of light, which is the case for electrons moving as electrical current in a wire, as shown in the paper: **McMahon, C.R. (2015)** *"Electron velocity through a conductor*". Thus, special relativity applies to such particles, which allows us to observe special relativity in the real world as the magnetic field. Thus, through the magnetic field, McMahon field theory explains that particles moving near the speed of light appear as energy fields.

First, allow me to present a new understanding of energy, as already presented in McMahon field theory: Theoretical unification of relativity and quantum physics, thus methods to generate gravity and time. (2010).

This theory begins explaining the nature of light using an example of electrons moving through an electrical wire. Since the velocity of these electrons can be considered as at or near the speed of light, we can assume that they are affected by both time dilation and length contraction, effects predicted by Albert Einstein's famous theory of relativity.

Let's perform a thought experiment: Let's imagine a stretched out spring. Let the straight stretched out spring represent the path of electrons moving in an electrical wire. Now, since length contraction occurs because of relativity, the electron path is affected. As a result, the straight line path of the electron is compressed. This is the same as allowing a spring to begin to recoil. As a result, the straight line path of the electron begins to become coiled. I call this primary coiling. This is the effect length contraction has on mass as is approaches the speed of light and is dilated by length contraction. When a particle such as an electron reaches the speed of light, it becomes fully coiled or fully compressed, and Einsteins length contraction and time dilation equations become equal to zero and "undefined". This particle, now moves as a circle at the speed of light in the same direction it was before. If this particle tries to move faster still, it experiences secondary coiling. Ie: the coil coils upon itself, becoming a secondary coil. This is why energy is observed on an Oscilloscope as waves: we are simply looking at a side on view of what are actually 3-dimentional coiled coils or secondary coils. Waves are not simply 2 dimensional; rather, they are 3 dimensional secondary coils. It was easy for scientists of the past to assume waves were 2 dimensional in nature, as the dimensional calculations and drawings for relativity were carried out on flat pieces of paper which are also 2-dimentional. The human imagination, however, is able to perform calculations in multiple dimensions. Now, let's consider the effect of time dilation.

When an electron approaches the speed of light, according to relativity, it undergoes time dilation. What does this actually mean? I believe this is the effect: time dilation allows a body, particle or mass- in combination with the effects of length contraction, to exist in multiple places at the same time. This is why we observe magnetic flux. Electricity is composed of high speed electrons, so these electrons would be affected by time dilation and length contraction. As a result, the electron is both inside the electrical wire, and orbiting around the wire as magnetic flux (because of full primary coiling at the speed of light).

Magnetic flux is the combined effect of length contraction and time dilation on the electron. The coiling effect is why electrical wires carrying electricity exhibit magnetic fields- the electron path is compressed into coils, and time dilation permits the electron to occupy multiple positions at the same time, which is why magnetic flux is detected as coils at different distances from the electrical wire. Please refer to figure 1 on the following page.

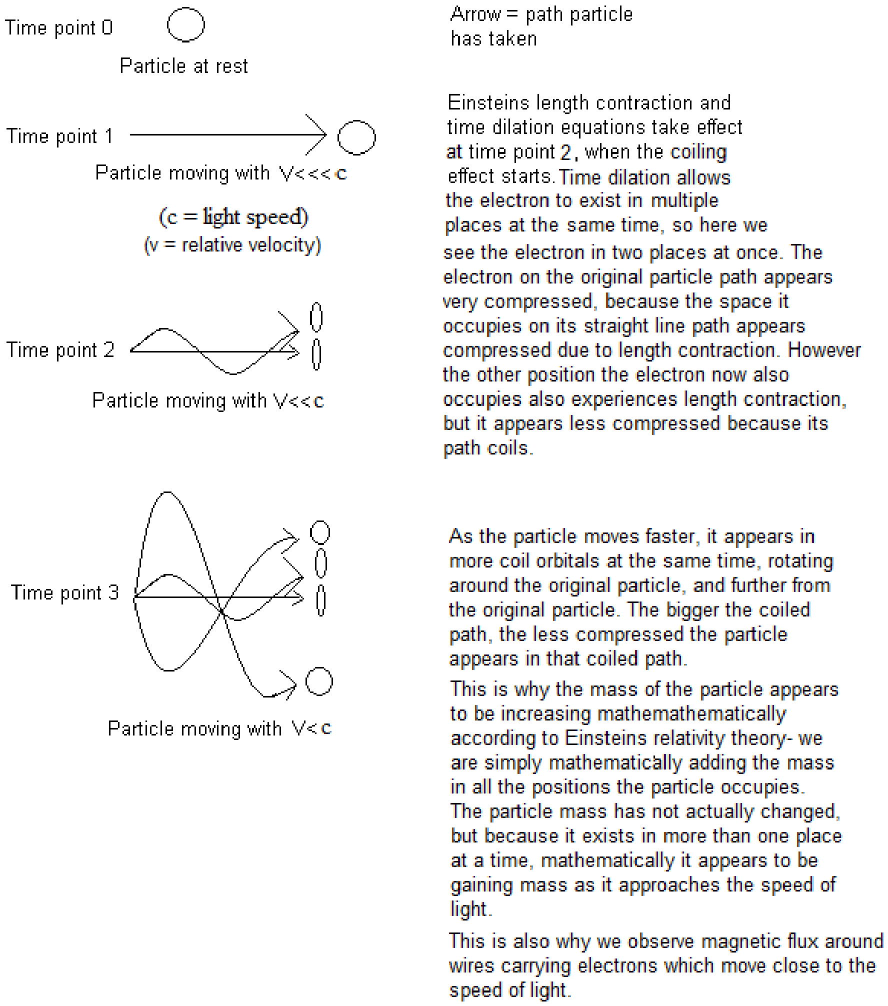

Figure 1: particle relativity- Taken from the McMahon field theory (2010): What we observe as relative stationary observers of a particle as it travels faster.

However- the McMahon field theory goes on to explain much more, including the electromagnetic spectrum- hence light, which I will briefly cover now. Refer to figure 2 below:

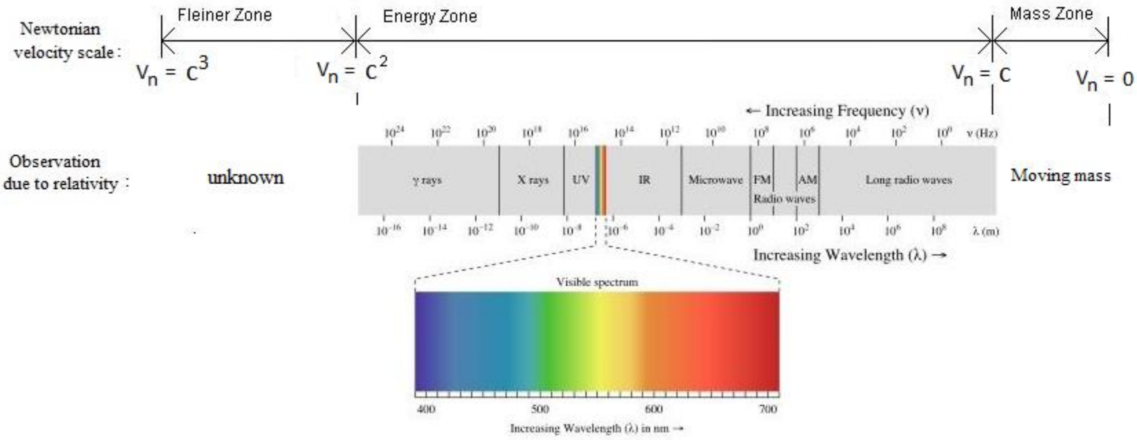

Figure 2: How an electron is observed at different Newtonian speeds: modified from the McMahon field theory (2010): Here, we see that as an electron moves with increasing speed according to Newtonian physics (although the speed we observe is dilated back to that of light because of relativity as in figure 4) and becomes a coil because of relativity, as the electron speed is increasingly dilated back to light it is observed as different types of energy. This is because the electron becomes more coiled (more velocity dilation) as it tries to move faster, so we say that the frequency increases and wavelength decreases. In this diagram, let the value of true, un-dilated Newtonian velocity due to relativity be Vn as in figure 4, and let the velocity of light be equal to c. I believe that electrons are on the boarder of mass and energy, so in the diagram above electricity would be at the point where Vn=c. If the electrons in electricity tried to move faster, they would be compressed further into a secondary coil to become long radio waves, then AM radio waves, then FM radio waves, then microwaves, then Infra-red (IR), then X-rays, then y-rays. Hence, the electromagnetic spectrum is nothing more than an electron dilated by different magnitudes of relativity. Other particles, such as protons and neutrons, will also have their own spectrums, which may be different or similar to that of the electron.

From Figure 2, we see that if electricity or electrons in an electrical wire tried to move faster, the electrons path would be compressed further, making it coil upon itself again creating secondary coiling or a coiled coil path. Hence it would be further affected by length contraction. As a result, the electron will be observed as different forms of energy. In the figure above, we see that an electron is considered as mass when it has an undilated velocity or Newtonian velocity between 0 and c. If an electron tries to travel faster than this, it enters the energy zone, where the electron path becomes fully compressed and moves as a full primary coil or circle which undergoes secondary coiling or coils upon itself. A particle moving as energy or a secondary coil has an un-dilated velocity or Newtonian velocity range between c and c^2. In this range, the particle now experiences secondary coiling, so the coil now coils upon itself. Figure 3, taken from the McMahon field theory (2010), also explains what happens if an electron tries to move faster than C^2: The secondary coiled or coiled coil path becomes overly dilated, and the length contraction effect becomes so great that the particle now undergoes tertiary coiling- ie it becomes a coiled coil coil. As a result, because of excess coiling the particle becomes undetectable or unidentifiable. These undetectable states are what are known as dark matter and/or dark energy. See figure 3.

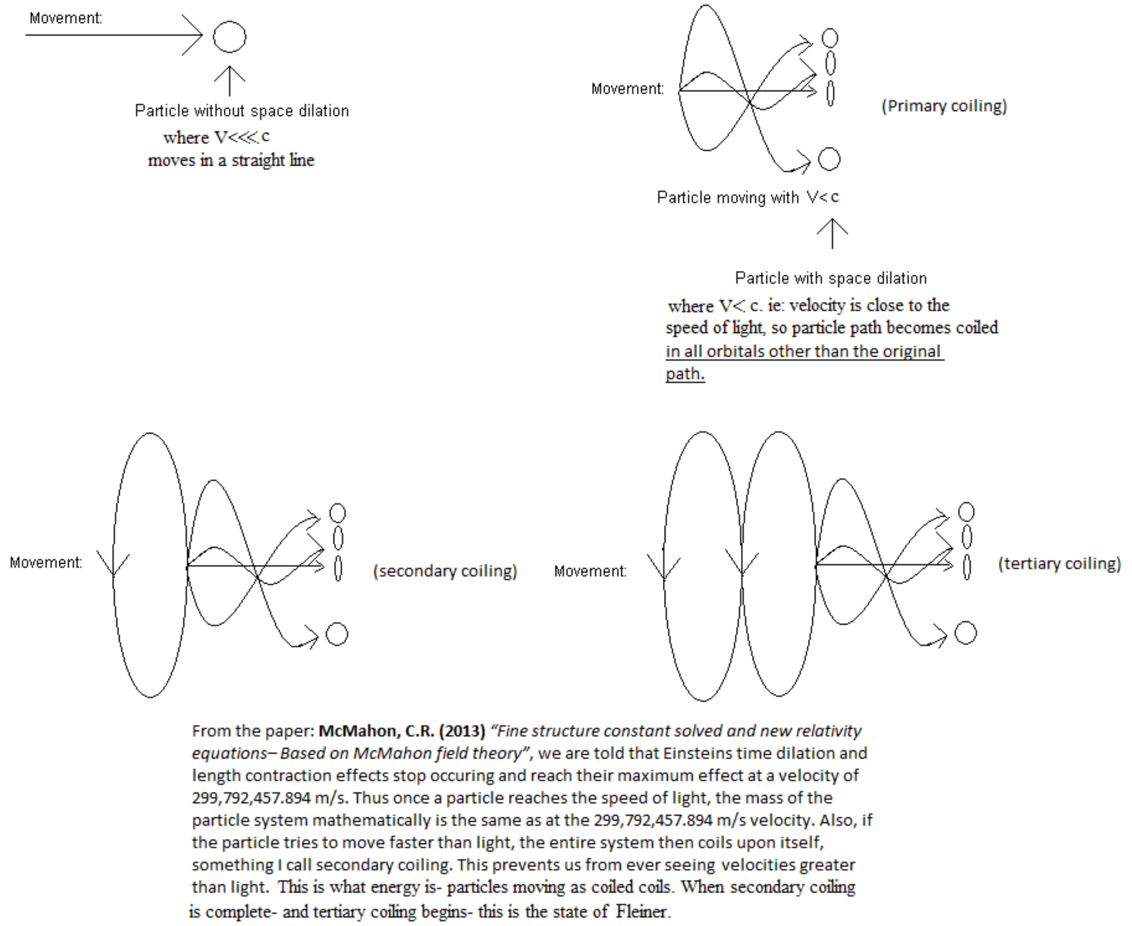

Figure 3: The actual affect Einsteins relativity theory has on the movement of a particle, causing it to first appear as mass during primary coiling, then energy during secondary coiling, and Fleiner during tertiary coiling, during which it becomes dark matter or dark energy. Einstein was unaware of this.

Now, we must consider conventional science of the current day. Conventional oscilloscopes are used for energy only. Therefore, the "waves" we see on oscilloscopes are in fact, the side views of secondary coils and higher degrees of coiling. Once full primary coiling is achieved, the fully compressed primary coil remains as it is, but with more momentum it begins to coil upon itself, which is secondary coiling. Thus, "wavelength" and "frequency" according to the science of this day are measurements from the reference point where a full primary coil forms.

Lets consider McMahon field theory (2010). From the McMahon field theory, we realize that magnetic flux arises due to the length contraction and time dilation of the electron. We observe this flux differently depending on the Newtonian velocity of the electron (ie: the electromagnetic spectrum in figure 2). Keep in mind that relativity prevents observers from measuring the true velocity (Newtonian velocity) of the electron- relativity dilates velocities greater than light back down to the speed of light. Refer to figure 4 below.

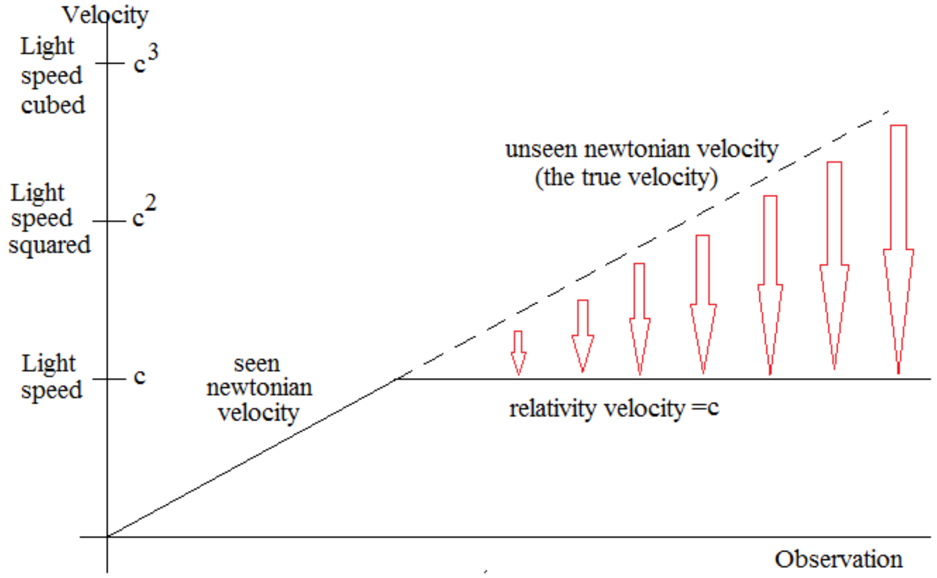

Figure 4: The dilation of the true velocity or Newtonian velocity by relativity. Here, we see that the dotted line represents the true velocity of particles travelling faster than the speed of light, but relativity dilates this velocity down to the speed of light which coils the path of the particle, so observers don't ever see particles travelling faster than light. The degree of velocity dilation is represented by the red arrows. Hence, the solid lines represent that which is seen, but the dotted line, which is the true velocity above light, is unseen due to dilation by relativity.

Now, figures 1 and 3 depict the length contraction effect on the electron, but the length contraction effect occurs simultaneously with the time dilation effect, which causes the electron to exist in multiple places along-side itself at the same time. As a result, as a particle approaches the speed of light, the original electron remains in its original linear position, but it also exists tangentially to itself, which rotates around its original self.

From figure 5 in A), we see a stationary electron in a wire. If this electron moves to the other end of the wire at speeds much less than N, or C for us on Earth, the particle obeys the laws of Newtonian Physics. In B), we see our electron now moves through the wire with a speed of c, so as discussed earlier it undergoes full primary coiling, which results in the appearance of a magnetic field (the magnetic field is the primary coiling) so it obeys the laws of relativity. From Einstein, when the electron moves at a speed where V=c, t'= undefined (time dilation = undefined) and s'= 0 (length compressed to zero). This means that to us, the particle no longer experiences time as in Newtonian physics, and now moves as a full primary coil or circle which propagates along with a speed equal to c. Because t'=undefined, the electron is able to be in more than one place at a time. Because s'=0, the particle is seen to move as a full primary coil or circle, which moves along the wire, always with a relative speed equal to c. this means that the electron is both inside the wire, and orbiting around the wire in multiple orbits multiple distances from the wire at the same time.
These "ghost or flux particles" which are all one particle that exist in different places at the same time, are responsible for the strange observations and theories made in quantum physics. These theories arise from the fact that ghost particles appear in their experiments involving high speed particles, such as the double slit experiment, and physicists cannot explain what they observe.

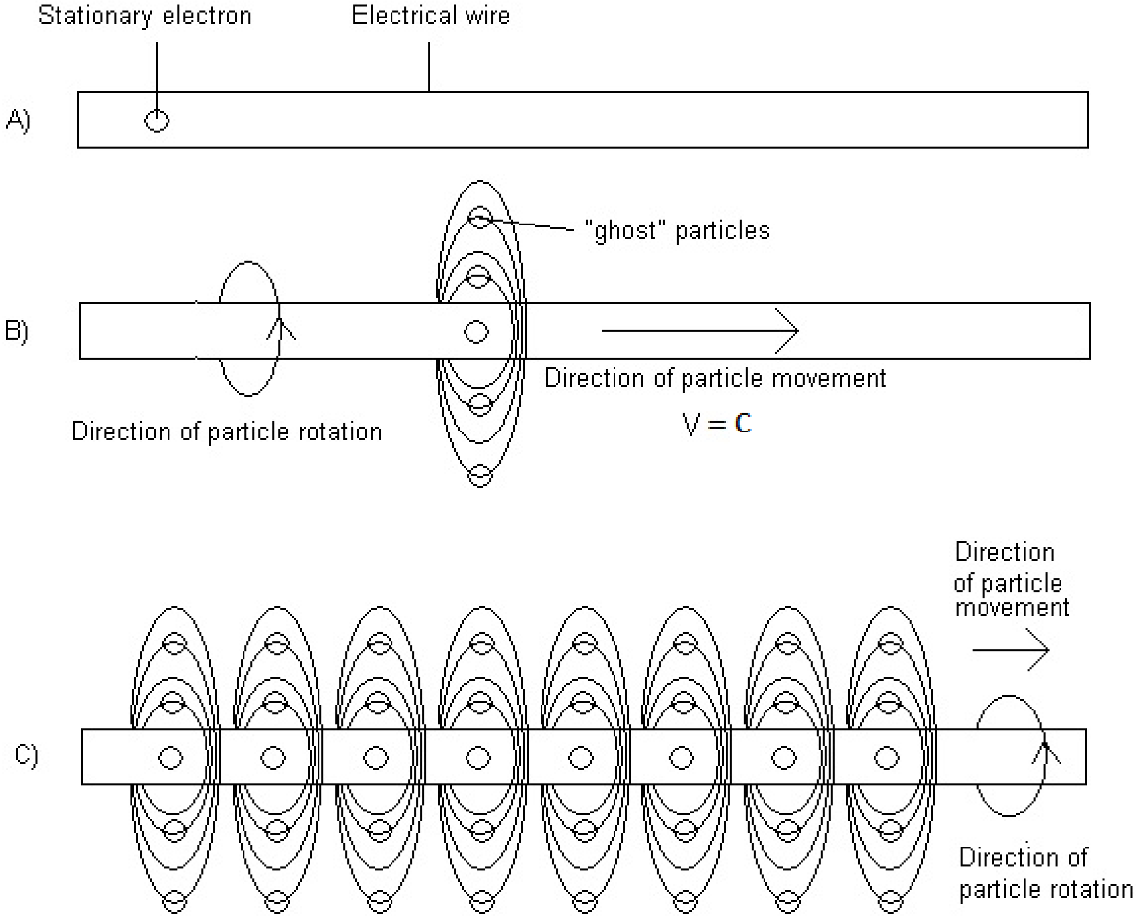

Figure 5: In A), we see a stationary electron in a wire. If this electron moves through the wire at speeds far below c, then the particle simply moves in a straight line through the wire, and no magnetic field is observed.
In B), our electron is now moving at c, so space dilation is occurring, causing the electron to now move as a circle (full primary coil) rather than in a straight line. As a result, the entire primary coil is always seen to move at a relative speed of c. However, the particle is experiencing maximum time dilation, t'=undefined. As a result, relative to us as stationary observers, the electron is in more than one place at the same time. In fact, the electron is both inside the wire, and orbiting around it in multiple orbital positions at the same time. As a result, we observe a magnetic field around the wire, which is just the electron orbiting around the outside of the wire. This is explained in section II table 1 of the McMahon field theory. When a particle is seen in more than one place at the same time, I call this a ghost or flux particle.
In C), the situation described in B) is exactly what is observed when electricity moves through an electrical wire. Note that conventional current moves in the opposite direction to electron flow.

From figure 5, we see that the original moving electrons we observe as electricity still exist inside the wire, but the length contraction and time dilation effects allow these electrons to simultaneously exist tangentially to their direction of movement outside the wire.

Double slit experiment explanation:

This simple model possibly solves the double slit experiment. Allow me to explain.
As discussed, energy moves as secondary coils, or coiled coils, which we have always assumed to be waves (largely due to polarization). Also, particles moving in a straight line that continue to accelerate will eventually become energy, and begin to move as coils, then coiled coils, rather than in straight lines. For electrons, such as electrons moving through a wire in the form of electricity, we know that electrons naturally move as a coil according to the left-hand rule (right hand rule for conventional current which goes in the opposite direction of electron flow), which we call magnetic flux. That is, as an electron moves toward

you, it will appear to be moving clockwise. This is because of the time and space dilation the electrons are experiencing. Since light is composed of high speed electrons, we can make light change from moving clockwise to anticlockwise with a mirror, which flips the coils orientation. Anyhow, if we perform the double slit experiment, assuming that light moves as coils (assume light is nothing more than high speed electrons, thus move as coiled coils which can have multiple planes of polarization, and these electrons are experiencing enough space dilation to appear to relative stationary observers as light), then we find that what we observe agrees with McMahon field theory. Please refer to figures 6, 7 and 8. Note: normal light contains all types of polarized light, circular, horizontal and vertical polarization, and variants thereof.

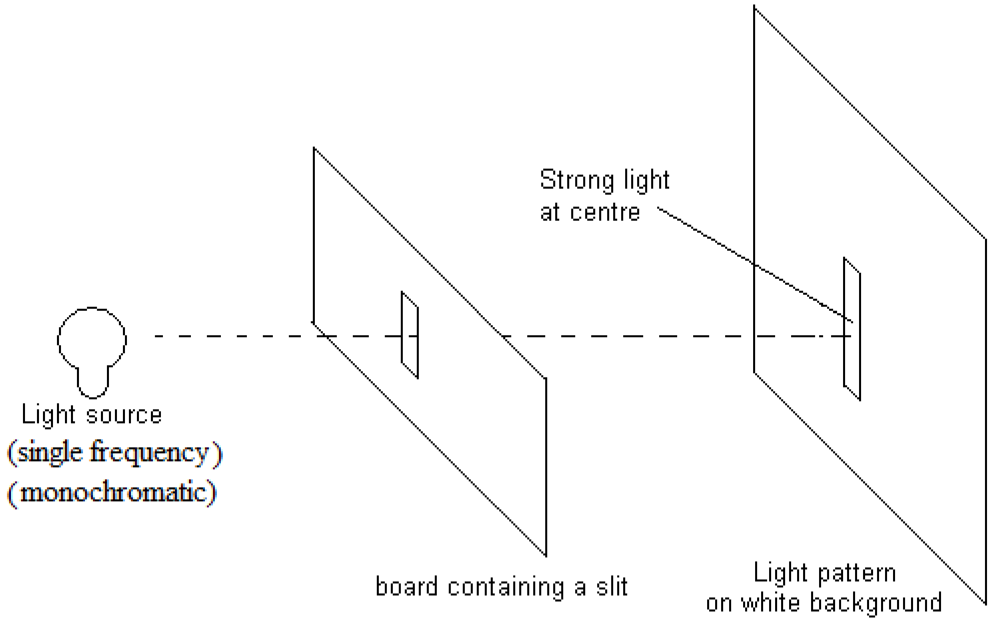

Figure 6: single slit-in-board light pattern. Particles and waves produce this kind of pattern.

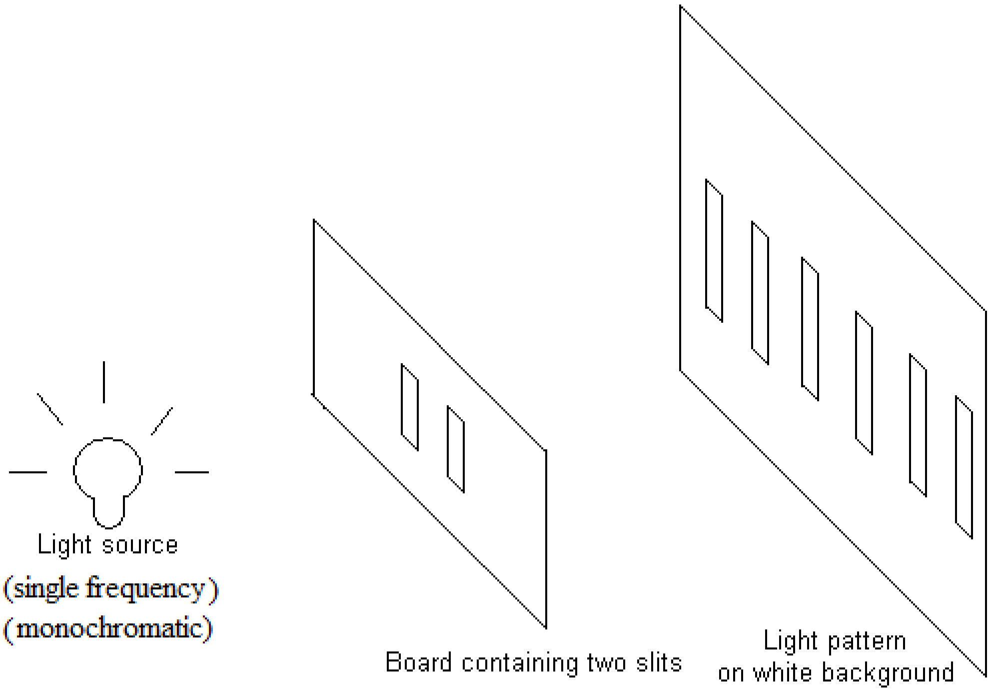

Figure 7: Double slit-in-board light pattern- waves (polarized coils) produce this kind of light pattern, which is due to waves interfering with each other, producing an interference light pattern.

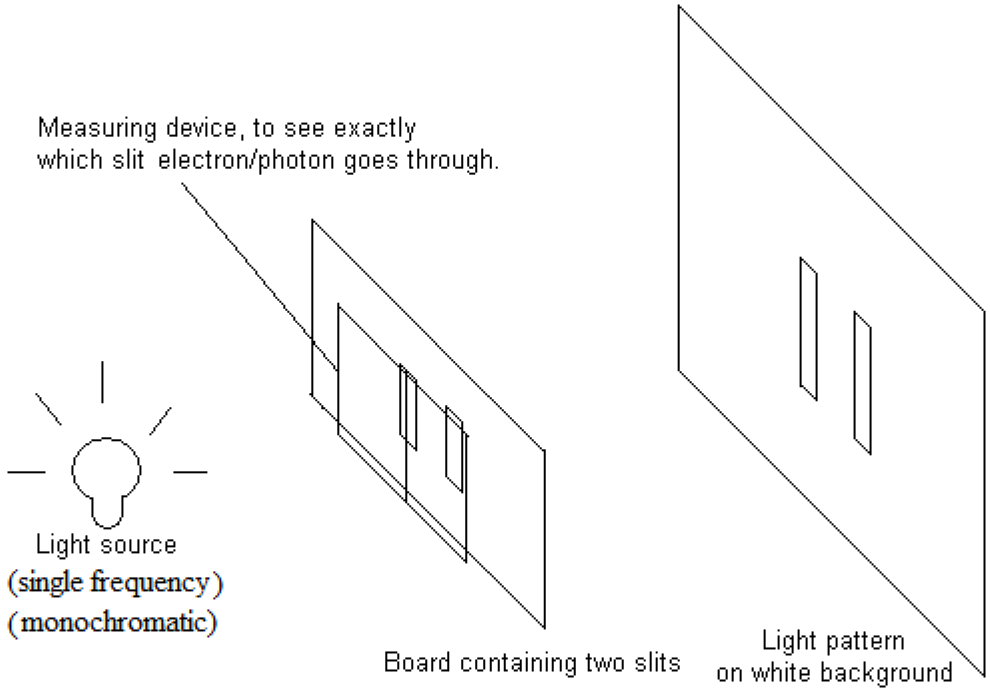

Figure 8: Measuring device to see which slit the photon/electron goes through, results in the appearance of two slits, the interference pattern is not observed. Particles produce this kind of light pattern. Can use a measuring device on both slits or just one- the effect will be the same.

From figure 6, we see that a board with a slit in it produces a slit light pattern, which is what we would expect to see if light behaves as a wave or particle, as both waves and particles produce this pattern. In figure 7, we see that when we use two slits, we get multiple slit patterns on the background, which is wave-like behavior. However, if we use a measuring device as in figure 8 to try and determine which slit each individual electron/photon goes through, the light pattern changes to the kind of pattern particles make.

This can easily be explained by the McMahon field theory. As described earlier, light is composed of high speed electrons moving as secondary coils or coiled coils. These high speed electrons are moving so fast that they are experiencing space and time dilation, because they are moving with a relative Newtonian speed within the range of $c \leq V \leq c^2$, as in figure 4. Therefore, when we use two slits, we see the kind of light pattern expected to be made by waves.
When we use a measuring device to try to determine which slit the photon/electron goes through, we are effectively slowing the Newtonian velocity of the photon/electron down. This is because an interaction with the moving photon/electron is required in order to observe it. If enough Newtonian velocity is lost, the observed velocity will become less than light and this causes the photon/electron to behave more like a particle. As a result, the motion of the photon/electron changes from a wave form (secondary coils or coiled coils) to a particle moving in a straight line (with little to no primary coiling).

Important point 1: If we use electrons which we know are moving particles for the double slit experiment instead of light, we observe the exact same diffraction patterns! This demonstrates that particles undergoing high velocity experience space dilation, causing them to move as coiled coils or partial secondary coils, just like light! This shows that light is the equivalent of high speed electrons. This is explained in section II of the McMahon field theory.

Important point 2: Physicists argue that if we observe the same diffraction pattern for electrons as light when performing the double slit experiment in which they assume light moves as a wave and electrons move in straight lines, then a single electron must pass through both slits at the same time in order to explain the diffraction pattern they observe. This is completely correct! When particles travel at relative Newtonian speeds (as in figure 4) where $V_n \geq c$ for us on Earth as in figure 4, we observe significant ghost particle behavior, causing the particle to appear in more than one place at the same time, so it appears that multiple particles are present which we observe as secondary coils as in figure 3! In this way, the electron can pass through both slits at the same time, and even interfere with itself, producing the diffraction pattern expected for waves.

I will describe an experiment that follows on from the double slit experiment, which again shows that McMahon field theory successfully unifies quantum physics and relativity. In this experiment, shown in figures 9 and 10, we have the same setup as in the double slit experiment. The only variant is the speed at which electrons are fired from an electron gun. If slow moving electrons are fired one at a time at two slits as in figure 9, this will lead to the electron pattern expected for particles moving in a straight line. However, if we fire high speed electrons one at a time at two slits as in figure 10, ghost particle behavior will cause the electrons to move as coiled coils or secondary coils, or waves, and these waves or secondary coils will interfere with each other, producing the electron pattern expected for waves. Ghost particle behavior allows the electron to be in more than one place at a time, hence it is able to pass through both slits at the same time and interfere with itself. Hence, the ghost particle behavior which arises as a resultant of McMahon field theory unifies quantum physics and relativity. Relativity expressed in multiple dimensions (ie: more than just time and length contraction, but also height and width expansion) leads to a type of space and time dilation that allows a particle to be in more than one place at a time, which is exactly what happens on the quantum level.

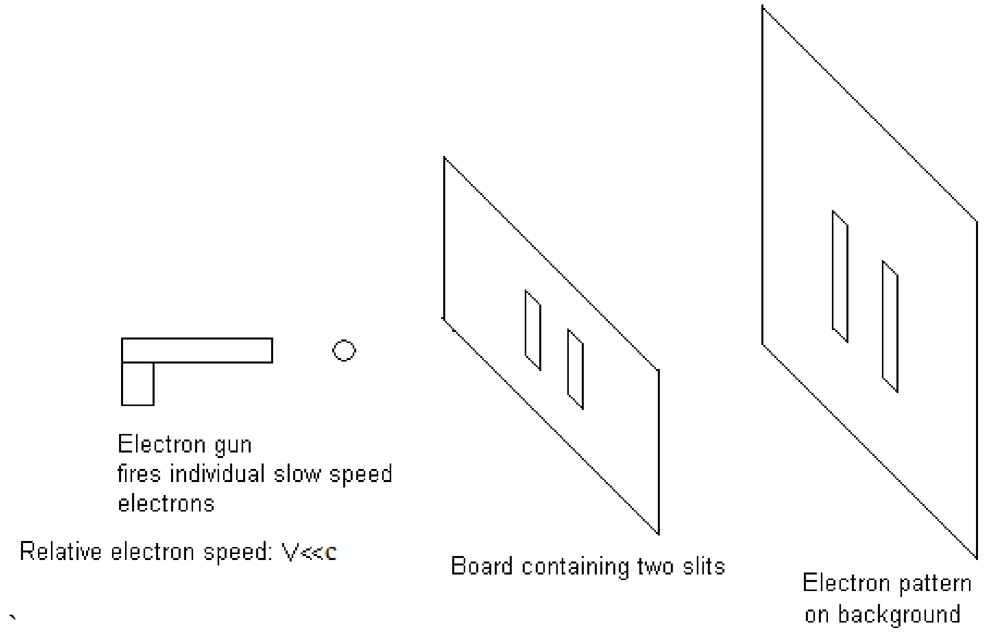

Figure 9: Slow moving electrons don't exhibit ghost particle behavior, and move in straight lines. Therefore, a slow moving electron can only pass through one slit at a time.

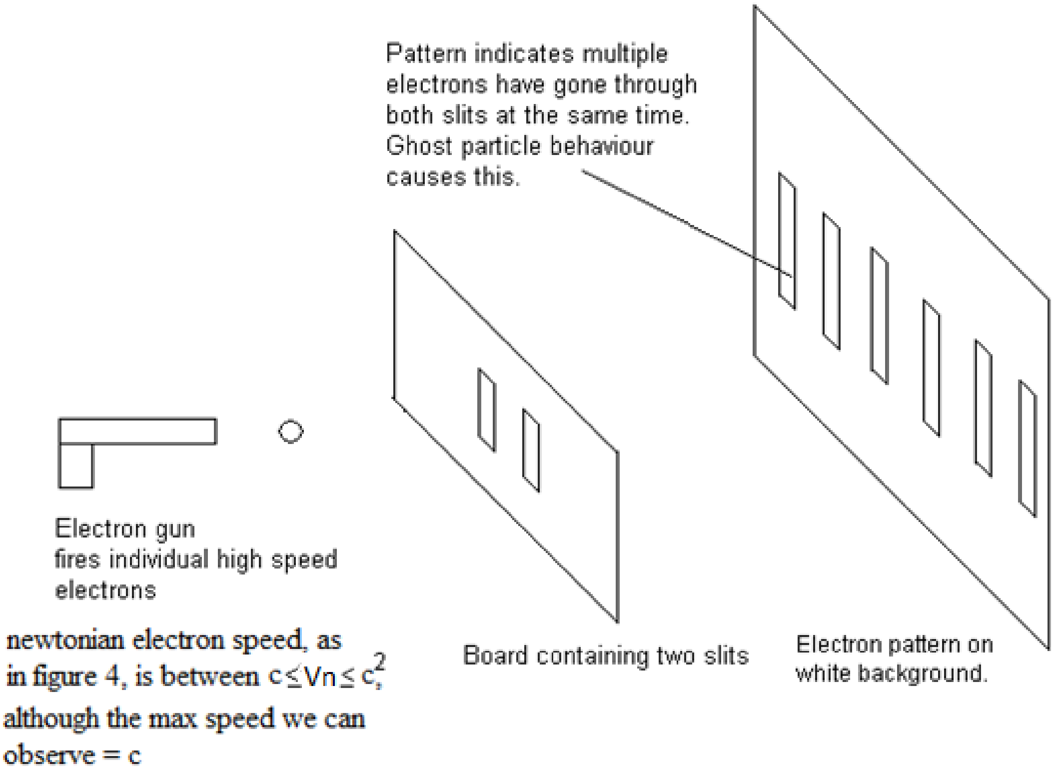

Figure 10: Fast moving electrons exhibit ghost particle behavior, and move as coiled coils or secondary coils. Therefore, a fast moving electron can pass through more than one slit at a time, because it exists in more than one place at a time, and can interfere with itself, producing the kind of interference pattern expected for waves.

This can be verified with quantum electrodynamics, or QED for short. It has been noticed that high speed particles are not "naked", as they are surrounded by a cloud of virtual particles, which I call ghost particles. On page 256 of the book "In search of Schrödinger's cat" by Gribbin, J. (1991), it states that: "Starting from the Schrödinger equation, the cornerstone of quantum cookery, the correct mathematical treatment of the electron yields infinite mass, infinite energy, and infinite charge." This is exactly the result expected by the McMahon field theory if you ignore the time dilation and length contraction effect limit ($v \leq$ 299,792,457.894 m/s) as presented in the paper: **McMahon, C.R. (2013)** *"Fine structure constant solved and new relativity equations– Based on McMahon field theory".* The general science journal.
Ignoring this limit causes a high speed electron to appear to be in an infinite number of positions all at the same time because t'=undefined, so we would expect to detect infinite mass, infinite energy, and infinite charge.

If you wish to observe the properties such as mass, charge and energy of a single electron, as well as the relative effects caused by a single electron or particle and ignore the ghost particles, you must cancel out the infinities in the solutions to the Schrödinger equation- this is called renormalization. Thus the appearances of apparent infinite mass, apparent infinite energy and apparent infinite charge for an electron actually are the correct solutions to the Schrödinger equations. However, the paper **McMahon, C.R. (2013)** *"Fine structure constant solved and new relativity equations– Based on McMahon field theory"*, Shows using the fine structure constant that at the relatively observed speed of light, an electron exists in 37557.7300843 places at the same time because of time dilation, which makes its mass, charge, and energy appear much larger, and is both a refined and better answer than that given by the Schrödinger equations. This is because the Schrödinger equations, like Einstein, deducted that at the speed of light t'=undefined, which made properties like mass, charge and energy appear infinite, without realizing that the particle now moves as a full primary coil **into** the page.

Thus, figure 11 summarizes why we observe what we do in the double slit experiment. Refer to figure 11.

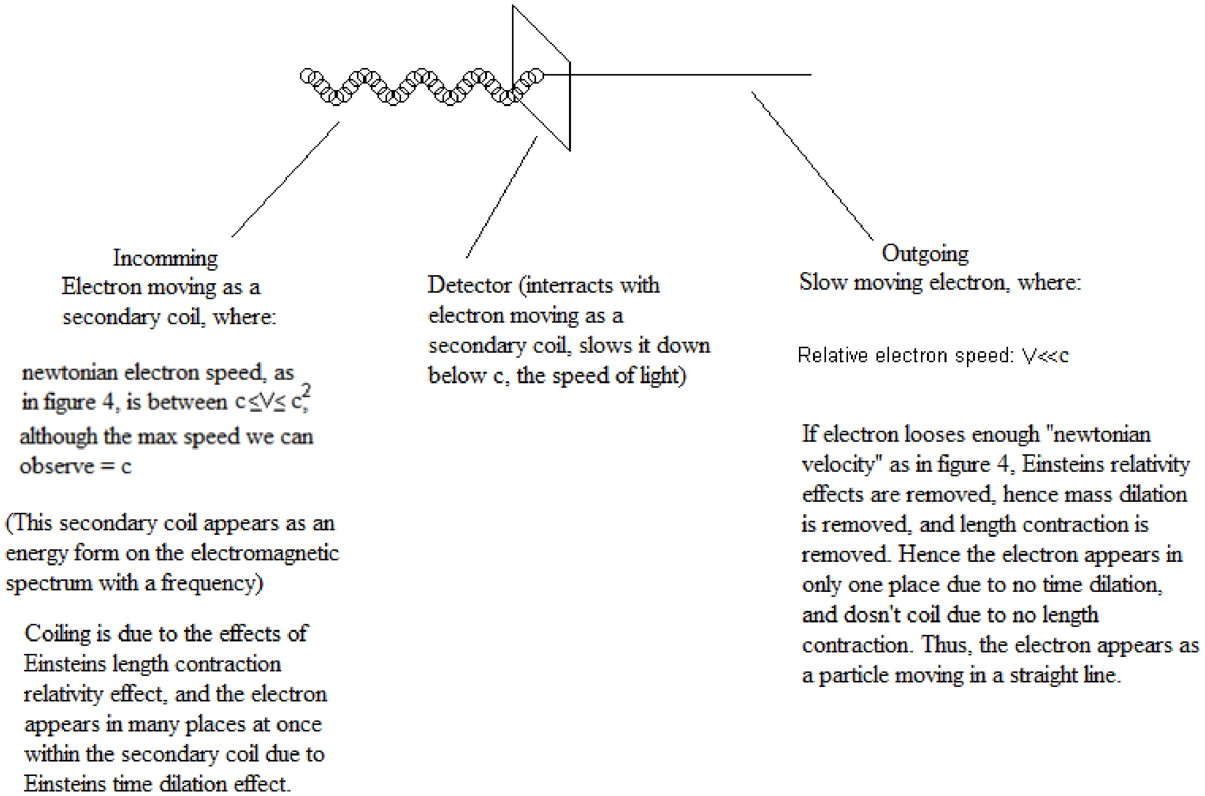

Figure 11: Fast moving electrons exhibit ghost particle behavior, hence exist in more than one place at a time due to Einsteins time dilation relativity effect and move as coiled coils or secondary coils due to Einsteins length contraction relativity effect. Therefore, a fast moving electron can pass through more than one slit at a time in the double slit experiment, because it exists in more than one place at a time, and can interfere with itself, producing the kind of interference pattern expected for waves. On the other hand, a slow moving electron, not experiencing Einsteins relativity effects, experiences no length contraction or time dilation, hence moves in a straight line in only one location at a time, thus can only pass through one slit in the double slit experiment, and cannot interfere with itself, producing a pattern expected for particles.

Note: for the interference pattern expected for waves in the double slit experiment, the electron must pass through both slits at the same time and interfere with itself, which probably happens about 50% of the time. If a single detector is present on only one of the two slits, this is enough to slow the Newtonian velocity down, removing Einsteins time dilation and length contraction effects, resulting in the interference pattern expected for particles, as coiling is removed and the electron now only exists in one place at a time.
Note: Also, some people may perform this experiment with polarized filters on the slits, in that the light coming out of one slit has vertical polarization, while the light coming out of the other slit has horizontal polarization. Such an experimental setup can prevent the photons from either slit from interfering with each other, because they have different planes of polarization so an interference pattern may not be observed. The bottom line is: photon flux

coils (or waves) must interfere with each other in order for an interference pattern to be observed. Thus, detectors can prevent photon flux coils from interfering with each other.

Delayed Choice Quantum Eraser Experiment:

This experiment is similar to the double slit experiment. It was first performed by, and presented in the paper: **Kim, Y.H., Yu, R., Kulik, S.P., Shih, Y.H. and Skully, M.O. (1999)** *"A Delayed Choice Quantum Eraser"*. In this experiment, a laser fires a single photon at two slits, after which the photon interacts with crystalline Beta-Barium Borate. This interaction causes the initial single photon to exist as two individual photons, which are said to be entangled. Refer to figure 12. This process is called "Spontaneous parametric down-conversion".

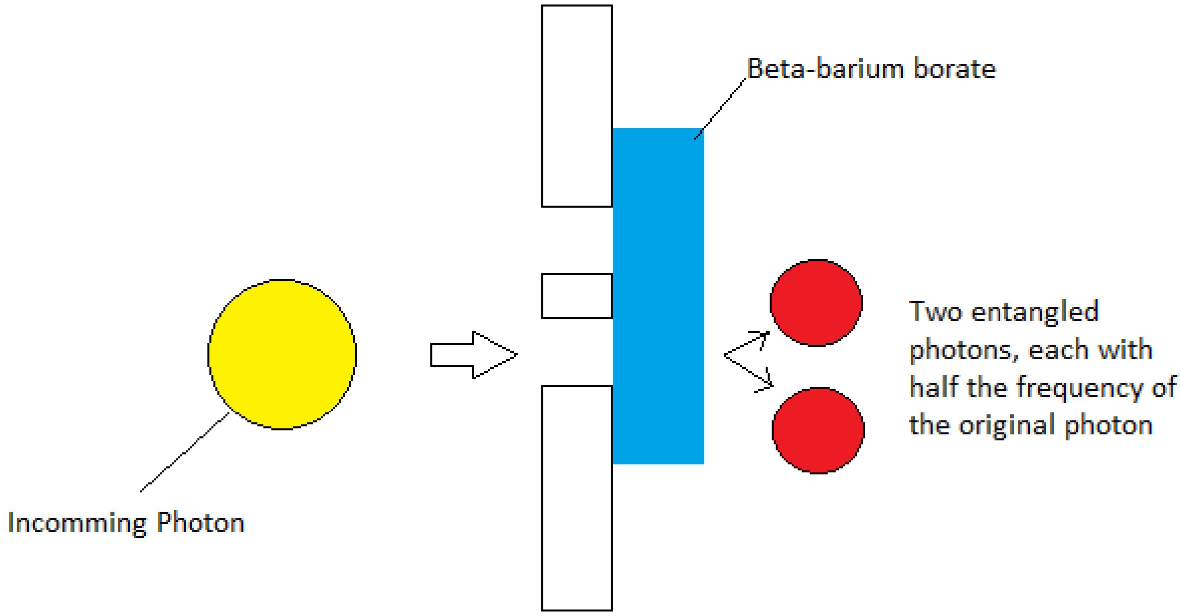

Figure 12: Incoming photon, passing through one of the slits is converted into two smaller entangled photons, each with half the frequency of the original photon. This effect has a very low probability of occurrence, as previously stated.

Spontaneous parametric down conversion efficiency is very poor, only one photon in every 10^{12} photons actually creates a pair of entangled photons (**Wikipedia (2015)** "*Spontaneous parametric down-conversion")*. It should be noted that each of these two entangled photons possess half the frequency of the initial photon. From McMahon field theory principles, what is happening is a single secondary coil (called a photon) is being split into two secondary coils, so as a result, each coil has half the frequency of the original. From McMahon field theory, a single photon is nothing more than a single particle, orbiting around itself at different locations all at the same time, in the form of a secondary coil, as described in figures 1 and 3. Since the initial photon or secondary coil exists because of relativity acting on a single particle, causing it to appear in many places at the same time as in figures 1 and 3, when this secondary coil interacts with Beta-Barium Borate to produce two entangled photons, these two entangled photons are actually the same photon, existing in two different places at the same time. Thus, both photons are composed of copies of the same particle, rotating around themselves in multiple locations at the same time. Because of this effect, whatever happens to one photon or secondary coil will happen instantly to the other, in that if one photon exhibits an in interference pattern, both will, regardless of their location or distance from each other.

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In the paper: **Kim, Y.H., Yu, R., Kulik, S.P., Shih, Y.H. and Skully, M.O. (1999)** *"A Delayed Choice Quantum Eraser"*, A 351.1nm Argon Ion pump laser is used to generate the initial photon, which has a frequency of 8.539 x10^{14} Hz. After entanglement with Beta-Barium borate, if two entangled photons are produced, each has a frequency of 4.2693 x 10^{14} Hz.

Wikipedia (2015) "*Ultraviolet"* tells us that ultraviolet radiation occurs in the wavelength range between 400nm and 100nm. This is a frequency range of 7.49x10^{14} Hz to 2.99x10^{15}Hz. **Wikipedia (2015)** "*Light"* tells us visible light has a wavelength range between 400nm or 400x10^{9} Metres to 700nm or 700x10^{9} Metres. Thus this would give a frequency range between 4.28 x10^{14} Hz to 7.49x10^{14} Hz.

Thus, in the experiment described, the initial photon appears as ultraviolet radiation. Infra-red radiation has a frequency range between 4.3x10^{14} Hz to 3x10^{11}Hz, according to **Wikipedia (2015)** "*Infrared"*. Thus, the entangled photons in the experiment described appear as infrared radiation. Both the initial photon and the entangled photons are not within the visible range for light.

Now, after the two entangled photons in figure 12 are generated, they are sent through a Glen-Thompson prism and then to a variety of semi-silvered mirrors. Such mirrors only reflect 50% of the light that hit it. As a result of this, light can either go through the semi-silvered mirror or be reflected by it. Refer to figure 13 below.

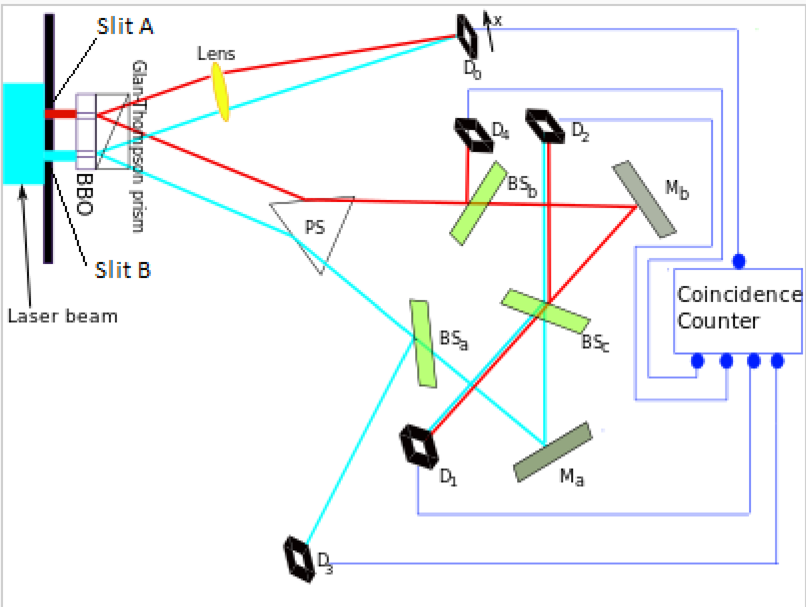

Figure 13: Delayed choice quantum eraser experiment, image modified from: Wikipedia (2015) "Delayed Choice Quantum Eraser" Here, we see the setup as used in **Kim, Y.H., Yu, R., Kulik, S.P., Shih, Y.H. and Skully, M.O. (1999)** *"A Delayed Choice Quantum Eraser"*. BBo= Beta barium borate. BSa, BSb and BSc are semi-silvered mirrors. Ma and Mb are both mirrors. PS is a prism to direct the photon path, D_0,D_1, D_2, D_3 and D_4 are detectors.

Figure 13 depicts the overall delayed choice quantum eraser experiment. Figure 12 is also depicted in the top left-hand corner of figure 13, where a photon provided via a laser beam, is fired at two slits, after which the photon interacts with Beta-Barium Borate. This can result in the generation of two entangled photons at either slit A or B. If two photons are produced at slit A, these photons can take the red paths in figure 13. If two photons are produced at slit B, these photons can take the blue paths in figure 13.

Now, notice one of the two photons, from slit A or B, must always hit the detector at D_0. This detector records the position at which the photon hits it. The optical path distances between the slits and detectors D_1,D_2,D_3, and D_4 are all equal, and are all 2.5m longer than the optical path from either slit to detector D_0. This means one of the two photons always strikes detector D_0 first: 8 nanoseconds before the other photon strikes any one of the other detectors.
In the cases where two photons are generated, one photon must strike detector D_0, but the other photon can take a number of different paths. Notice that:

1) All photons that strike detector D4 can only come from slit A.
2) All photons that strike detector D3 can only come from slit B.
3) Photons that strike detectors D1 or D2 could come from slit A or B, we don't know.

All photons that strike detector D_0 have their positions and time recorded, thus we can determine whether an interference pattern occurs on this detector. The photons that strike the other detectors only have the time a photon hits them recorded. Thus, whenever a photon strikes a particular detector, we can see whether an interference pattern is produced by the other photon on detector D_0. It was found that:

1) When one of the two entangled photons hits either detector D_4 or D_3, the other entangled photon that hits detector D_0 shows no interference pattern.
2) When one of the two entangled photons hits either detector D_1 or D_2, the other entangled photon that hits detector D_0 does show an interference pattern.

Because we know the path taken by the photons that strike detectors D3 and D4, The experimenters assumed that the wave function of the photon is collapsed because we know what path the photon has taken. Also, because we don't know the exact path taken by photons that strike detectors D_1 and D_2, it is assumed by the experimenters the wavefunction doesn't collapse. Hence, it is assumed that the observer collapses the wavefunction if he knows the path the photon has taken.

Alternative explanation for the Delayed Choice Quantum Eraser Experiment that doesn't depend on an observer:

From McMahon field theory, there is another possible explanation, that effects figure 12. It will not be the same as the explanation for the double slit experiment previously described, as there are no detectors to interact with the entangled photons which could in theory slow them down before they make a diffraction or interference pattern. Considering figures 1, 2 and 3, in that a photon is a single particle dilated by relativity causing it to appear in more than one place at a time and to coil, we arrive at figure 14. In this figure, assuming no process is 100% efficient, some stray flux from the original photon must emerge from the other slit, which don't have enough energy to register on detectors. ***After all, from conventional wave theory, the photon can pass through both slits.***

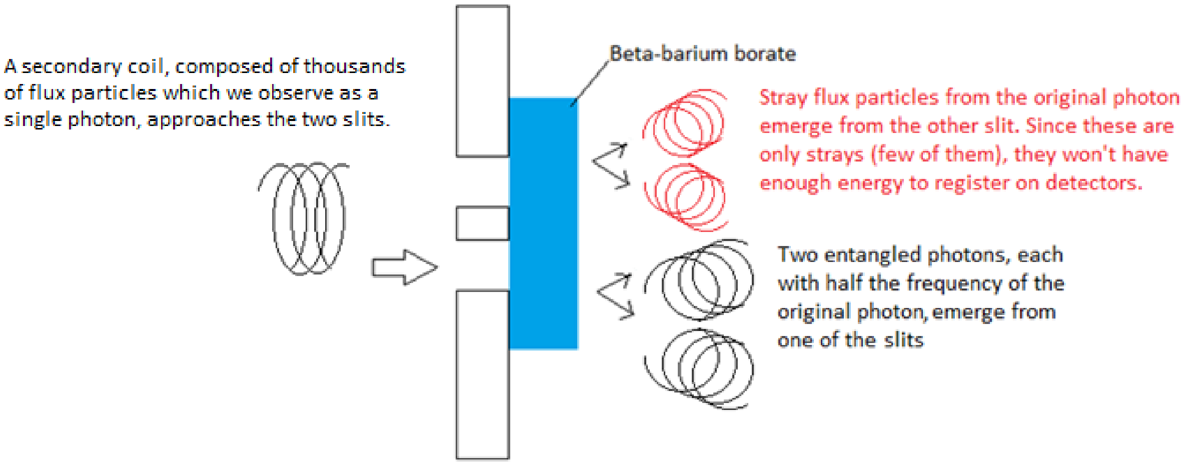

Figure 14: Incoming photon, passing through one of the slits is converted into two smaller entangled photons, each with half the frequency of the original photon. If no process is 100% efficient, including entanglement, then some stray flux particles from the original photon must emerge from the other slit. These stray flux particles don't have enough energy to register on detectors.

Given that no process is 100% efficient, it is also possible that when photons strike any of the semi-silvered mirrors, some of their flux takes the path the photon does not take. For example, if the photon goes through a semi-silvered mirror, some flux may be reflected. As a result of stray flux arising from the semi-silvered mirrors and figure 14, we see that stray photon flux particles that are too weak to register on detectors arrive at all detectors whenever an entangled photon pair is created.

Now when we consider figure 13, we see that <u>since the path lengths from each slit to each of the detectors D_1, D_2, D_3, D_4 are all equal</u>, when the stray flux meets up with one of the entangled photons and moves with it, <u>the stray flux causes the photon to exhibit an interference pattern.</u> This only happens on the "BSc" semi-silvered mirror or beam splitter in figure 13 (where the red and blue path lines overlap). Once an entangled photon meets up with some stray flux on the "BSc" beam splitter, the two move together, interfering with each other. <u>This is why interference patterns are only seen whenever detectors D_1 and D_2 are struck with one of the entangled photons.</u>

Now, here is the interesting part: Since from McMahon field theory as shown in figures 1 and 3, a single particle appears in more than one place at a time due to special relativity as it approaches the speed of light, which also causes coiling to the particle path. Entangled photons are therefore just one photon or secondary coil that exists in more than one place at the same time. As a result, if one photon experiences interference, the other will also. This is how entangled photons that move toward detector D_1 and D_2 which are interfered with by stray photon flux also interfere with the photon that strikes detector D_0- They are the same photon!

But detector D_0 registers first!

Kim, Y.H et al (1999) *"A Delayed Choice Quantum Eraser"* lacks important information. It does not tell us the component lengths that the entangled photons travel. For example: is the path length from the slits to the semi silvered mirror "BSc" a shorter distance than from the slits to detector D_0? If so, interference can happen on the mirror "BSc" <u>before</u> the other photon strikes detector D_0. If these photons are the same photon in different places at the

same time, then interference at one location will result in interference at the other location. ***This would explain why detector D_0 can tell us whether or not the pattern on the other detector (D_1, D_2, D_3, or D_4) will give an interference pattern beforehand*. *Thus the explanation just provided for this experiment is a valid one.***
All we are told is that the optical path distances between the slits and detectors D_1,D_2,D_3, and D_4 are all equal, and are all 2.5m longer than the optical path from either slit to detector D_0.

Problem with this explanation:

If the path length from the slits to the semi silvered mirror "BSc" is not a shorter distance than from the slits to detector D_0, then it would seem that detector D_0 can tell us beforehand whether or not the other entangled photon will experience interference by meeting up with stray photon flux on the "BSc" mirror which occurs at a later time.
If this is the case, then it would be an interesting result. It needs to be confirmed. Such a result could mean a few things:

A) Information can travel backwards in time.
B) The result of the experiment is determined before it is run.
C) Time could behave in ways we don't yet understand.
D) Reality is a simulation

Explanation C would be the most probable explanation if the path length from the slits to the semi silvered mirror BSc is not a shorter distance than from the Beta Barium Borate to detector D_0.
Explanation B is concerning. It would indicate that nothing is random, that all event outcomes have been predetermined.
Explanation A is also highly probable. It would explain why entangled photons, light years apart from each other, can exchange information instantly. From Special relativity, nothing is supposed to be able to travel faster than light. However, if information can travel backwards in time, then it would only seem that information can travel faster than the speed of light.

The result I'm hoping for:
Explanation D- The most interesting of all

Explanation D is also concerning- but exciting. Again, ***in order for explanation D to be a convincing explanation, the path length from the slits to the semi silvered mirror BSc must be a longer distance than from the slits to detector D_0. This could indicate that reality is trying to present itself to the observer in a way that convinces the observer that reality is real, despite being fake.*** Thus, this experiment may have revealed a glitch in the simulation we call our reality. If the experiment is knowledge based, meaning that if the observer 'knows" what the outcome must be, then it will be. If the experiment is faith based, meaning that if the observer does not know what the outcome must be, the simulation will adjust the outcome of the experiment to a preset default result. Thus, the act of "knowing" forces the simulation to behave in a limited way to convince the observer that reality is real, but the act of "not knowing" allows the simulation to behave in ways that would not be possible if reality was real. Thus, the act of "knowing" something can affect the simulation!
What I find even stranger, is that this idea ties in with religious beliefs. Recall the religious story of Adam and Eve: Adam was told by God not to eat from the tree of knowledge, and

that if he did he would be removed from paradise. This is because if our reality is a simulation and Adam knew how reality should behave, reality could no-longer behave in impossible ways. The simulation would be forced to behave in such a way as to convince Adam that it was real.
Thus, if we "know" too much about how reality should behave, we could in theory cause our simulation to glitch and fail.

I am hoping that this is the case, as it would mean that it is possible to manipulate reality. Just as computer simulations can be hacked, then so too can the simulation we call reality.

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