Misunderstanding the Interference Pattern Behavior in the Double-Slit Experiment

Kasun Thilina Fernando
kasunhtf@gmail.com

Article

Abstract: This paper presents an alternative interaction-based interpretation of the single-slit and double-slit experiments. It proposes that interference-like patterns arise from electromagnetic attractive and electromagnetic repulsive interactions between photons or electrons and electrons near slit boundaries, rather than from traditional wave-particle duality alone. The model suggests that these interactions modify particle trajectories and produce observable fringe patterns. A classical analogy and discussion of slit geometry are included to support the concept, encouraging further theoretical and experimental investigation into quantum interference phenomena.

Keywords: Quantum mechanics, Double slit experiment, Single-slit diffraction, Electron-photon interaction, Slit-boundary interactions, Quantum foundations

- ☑ One possible quantum relationship between electrons and photons is attraction through interaction.
- ☑ Since both electrons and photons are quantum particles, they interact through electromagnetic quantum fields.
- ☑ Photons can influence electron motion and energy states, creating observable quantum effects.

We can provide more examples of quantum interactions between electrons and photons. I observed possible quantum relationships involving electromagnetic attraction and electromagnetic repulsion between electrons and photons. This may occur because both electrons and photons behave according to the principles of quantum mechanics.

Note 01: Our main subject is the **double-slit experiment.** However, we are discussing the single-slit experiment because both single-slit and double-slit experiments produce fringe interference patterns. The focus of this discussion is the mechanism behind the formation of these interference patterns.

By first understanding the single-slit experiment, the double-slit experiment can be understood more easily and with less confusion. Therefore, discussing the single-slit case provides a simpler foundation for understanding the broader behavior observed in double-slit experiments.

01) Way of Mission

I deeply studied the quantum relationship between electrons and photons. During that study, I noticed an issue in understanding the double-slit experiment.
The problem arose from two experiments: the experiment in which electrons are fired one by one, and the single-slit experiment that produces a fringed interference pattern. Understanding how these experiments create an interference pattern became a major question in my study.

02) Where the Issue Happened

When photons pass through a single slit, all the changes occur inside the slit opening. Photons always travel at the constant speed of light, which means their speed does not change. The only thing that changes is the direction of the photons.

There are electrons on both sides (left and right) of the slit. Since electrons also behave according to quantum mechanics, I identified the electromagnetic attraction and electromagnetic repulsion in the following way:

1. Electrons electromagnetic attract photons.
2. Electrons electromagnetic repel other electrons.

03) Fringe Interference Pattern Effect

Simple Logic:
According to this simple analogy, imagine that you and a friend each have 5 balls.

- ☑ First, you throw away 1 ball, and your friend also throws away 1 ball. The total number of balls remaining is **8.**
- ☑ Next, both of you start again with 5 balls each. This time, you each throw away 2 balls. The total number of balls remaining is **6.**
- ☑ Again, both of you start with 5 balls each and throw away 3 balls each. The total number of balls remaining is **4.**

If you and your friend always remove the same number of balls at the same time, the total number of balls will always be an even number. You will never obtain totals such as **9, 7, 5, 3, or 1.**
According to this proposal, this simple logic provides an analogy for understanding the formation of fringe interference patterns. The pattern appears because certain outcomes are reinforced, while other outcomes do not occur, producing a structured distribution rather than a random one.

03, *a*) Total Lengths

Two slit-length definitions are used in this model:

- ☑ **Total slit length (Lt)** – the distance from the left slit wall to the right slit wall.
- ☑ **Side slit length (Ll / Lr)** – the distance from a slit wall to the photon (particle) at a particular position within the slit.

The numerical values presented in the following examples are simplified and are intended only to illustrate the underlying concept.
They are not experimental measurements; rather, they are used to aid understanding of the proposed mechanism responsible for the formation of the fringe interference pattern.

$Fl - Fr = Fs$	$Ll + Lr = Lt$
1N- 0 = **1N**	(0.1 + 0 = **0.1mm**)
0.9N -0.1N = **0.8N**	(0.09 +0.01= **0.1mm**)
0.8N -0.2N = **0.6N**	(0.08 +0.02 =**0.1mm**)
0.7N -0.3N = **0.4N**	(0.07 +0.03= **0.1mm**)
0.6N -0.4N = **0.2N**	(0.06 +0.04= **0.1mm**)
0.5N -0.5N = **0**	(0.05 +0.05= **0.1mm**)
0.4N -0.6N = **(0.2N)**	(0.04 +0.06= **0.1mm**)
....etc.	

Sideways Force (Fs)

Total slit length (Lt) = (k) *Constant*

Table 01, Total slit length & Sideways Force

At this stage, the total slit length (the distance from the left slit wall to the right slit wall) is fixed at 0.1 mm and remains constant (k).

Therefore, the following relationship is maintained:

Distance from the left slit wall to the particle **+** particle width **+** distance from the particle to the right slit wall = constant (k) (0.1 mm).
In other words, regardless of the particle's position within the slit, the sum of these three distances always equals the constant total slit length of 0.1 mm *(This length is constant 0.1mm for this experiment only).*

Lt = Total slit length
Ll = Distance from the left wall to the particle
w= Particle width
Lr = Distance from the particle to the right wall

$$Lt = Ll + w + Lr$$

$$k = Ll + w + Lr$$

03, *b*) Total Electromagnetic Attraction/Repulsion Force (Ft)

In this example experiment, the total electromagnetic attraction and repulsion acting between the left and right sides of the slit is remain constant 4N *(This total force is constant 4N for this experiment only).*

Force from the left slit wall **+** force from the right slit wall **=** constant (4N).
Total electromagnetic attraction/repulsion force = 4N

$Fl - Fr = Fs$	$Fl + Fr = Ft$
4.0N - 0 = **4.0N**	(4+ 0 **= 4N**)
3.9N - 0.1N = **3.8N**	(3.9+0.1= **4N**)
3.8N - 0.2N = **3.6N**	(3.8+0.2= **4N**)
3.7N - 0.3N = **3.4N**	(3.7+0.3= **4N**)
3.6N - 0.4N = **3.2N**	(3.6+0.4= **4N**)
3.5N - 0.5N = **3.0N**	(3.5+0.5= **4N**)
3.4N - 0.6N = **2.8N**	(3.4+0.6= **4N**)
.....etc.	

Sideways Force (Fs)

Total electromagnetic attraction/repulsion force (Ft) = (k) *Constant*

Table 02, Total electromagnetic attraction/repulsion force & Sideways Force

F_l = Left-side attraction/repulsion force
F_r = Right-side attraction/repulsion force
F_t = Total electromagnetic attraction/repulsion force

$$F_t = F_l + F_r$$

$$k = F_l + F_r$$

Therefore, the following conditions are maintained:

- ☑ Total slit length = constant
- ☑ Total electromagnetic attraction/repulsion force from both slits = constant

03, c) Sideways Force (Fs)

According to example experiment, the fringe interference pattern is produced by the sideways force acting on photons as they pass through the slit.

Using the example values:
0.8N, 0.6N, 0.4N, 0.2N these represent non-zero sideways forces. The magnitude of the sideways force bends the photon trajectory, causing photons to arrive at locations corresponding to the bright fringes observed on the screen.

In contrast, the values:
0.7N, 0.5N, 0.3N, 0.1N are assumed not to generate a sideways force sufficient to bend the photons. As a result, these positions correspond to dark fringes on the screen.

The alternating appearance of bright and dark fringes produces the observed fringe interference pattern.

Net attraction/repulsion sideways force = Left-side attraction/repulsion force − Right-side attraction/ repulsion force

F_s = Net attraction/repulsion sideways force
F_l = Left-side attraction/repulsion force
F_r = Right-side attraction/repulsion force

$$F_s = F_l - F_r$$

03, d) Relationship between slit length and electromagnetic attraction/repulsion

The side slit length (the distance from a slit wall to the particle) is inversely proportional to the electromagnetic attraction/repulsion acting on that side.

According to this relationship:

- ☑ If the side slit length is short, the electromagnetic attraction/repulsion is strong.
- ☑ If the side slit length is long, the electromagnetic attraction/repulsion is weak.

The same relationship apply to both the left and right sides of the slit.

$$(L_l \,.\, F_l) - (L_r \,.F_r)$$

$$F_s \,.\, L_t = w\,(L_l \,.\, F_l) - (L_r \,.F_r) \text{ --- } (1)$$

$$L_t = L_l + w + L_r \text{ --- } (2)$$

Substitute Equation (2) into Equation (1)

$$F_s \,.\, (L_l + w + L_r) = w\,(L_l \,.F_l) - (L_r \,.F_r)$$

This combines both equations into a single formula.

$$F_s = \frac{w\,(L_l \,.F_l) - (L_r \,.F_r)}{(L_l + w + L_r)}$$

$$F_s = \frac{w\,(L_l \,.F_l) - (L_r \,.F_r)}{L_t}$$

θ = Photon deflection angle
k= Deflection constant

$$\theta = k\left(\frac{w\,(L_l \,.F_l) - (L_r \,.F_r))}{L_t}\right)$$

- ☑ When the total slit length is small, only a few bright fringes are produced.
- ☑ As the total slit length increases, the number of bright fringes also increases.
- ☑ When the total slit length reaches its maximum limit, the fringe interference pattern gradually disappears.

This behavior is attributed to the electromagnetic attraction and repulsion exerted by the left and right slit walls. As the total slit length becomes larger, the distance between the photon and the slit walls increases. Consequently, the electromagnetic attraction/repulsion acting on the photon becomes weaker.

At sufficiently large slit lengths, the electromagnetic forces from the slit walls are too weak to significantly attract or repel the photon. As a result, the photon experiences little or no sideways deflection and travels along an approximately straight path.

According to this hypothesis, the disappearance of the fringe interference pattern at large slit lengths occurs because the slit-wall electromagnetic forces can no longer bend the photons sufficiently to produce distinct bright and dark fringes.

04) Photons:

When photons travel through the slit, the electrons on both sides may influence their motion. If the electron electromagnetic attraction is stronger on one side, the photon's path could bend outward, causing the photons to spread in a manner similar to the effect of a concave lens.
This process produces a fringed interference pattern.

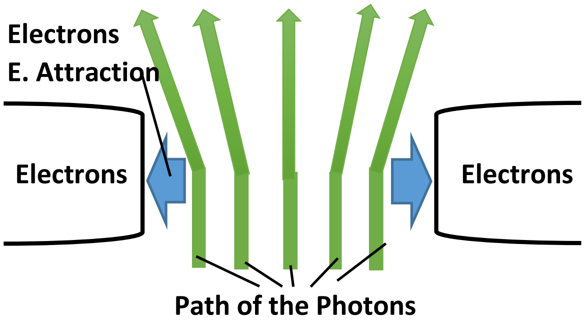

Figure 01, inside the slit opening, Photons path

Net Electromagnetic Attraction = Left-side Electromagnetic Attraction (–) Right-side Electromagnetic Attraction

05) Electrons:

When electrons travel through the slit, the electrons on both sides may influence their motion. If the electron electromagnetic repulsion is stronger on one side, the electron's path could bend inward, causing the electrons to spread in a way similar to the effect of a convex lens.

This process produces a fringed interference pattern.

Net Electromagnetic Repulsion = Left-side Electromagnetic Repulsion (–) Right-side Electromagnetic Repulsion

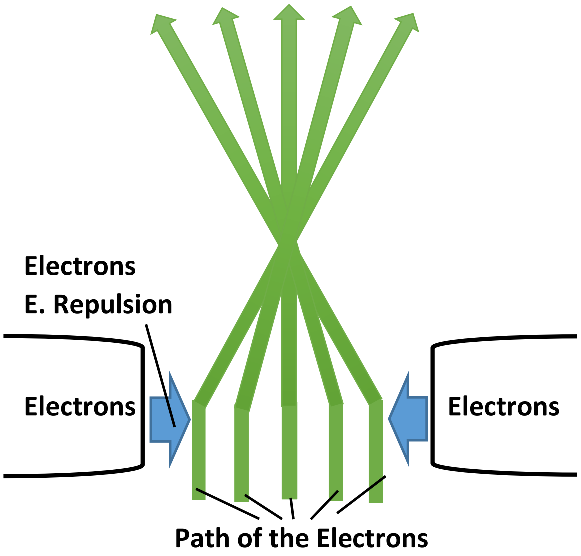

Figure 02, inside the slit opening, Electrons path

06) The Deflection Angle from Newtonian Mechanics

Symbol	Meaning	Unit
θ	Deflection angle	Degrees or radians
F	Net sideways force (attraction – repulsion)	N (Newtons)
L	Slit length (interaction distance)	m
m	Mass of the particle	Kg
Vx	Forward velocity	m/s

Step 1 - Newton's Second Law

A net sideways force ***F*** causes a sideways acceleration a_y:

$$a_y = \frac{F}{m}$$

Step 2 - Interaction time

The particle travels through the slit of length ***L*** at constant forward velocity **Vx.**

The time inside the slit is:

$$t = \frac{L}{Vx}$$

Step 3 - Sideways velocity after the slit

Starting from zero sideways velocity:

$$V_y = a_y \, . \, t = \frac{F}{m} \, . \, \frac{L}{Vx}$$

Step 4 - Resultant direction angle

After exiting the slit, the particle has:

Forward velocity Vx
Sideways velocity Vy

The deflection angle is given by trigonometry:

$$tan\,(\theta) = \frac{V_y}{Vx}$$

Substitute Vy from Step 3:

$$tan\,(\theta) = \frac{\frac{F}{m} \cdot \frac{L}{Vx}}{Vx}$$

Step 5 - Simplify

$$tan\,(\theta) = \frac{F\;.\;L}{m\;.\;V_x^2}$$

Therefore:

$$\boxed{\theta = tan^{-1}\left(\frac{F\;.\;L}{m\;.\;V_x^2}\right)}$$

We need clear evidence to identify the origin of the sideways force *(Fs)*. According to this proposal, electromagnetic attraction and electromagnetic repulsion are the key effects responsible for the behavior observed in both the single-slit and double-slit experiments.

In double-slit and single-slit experiments, passing charged particles such as electrons, protons, or ions can interact electromagnetically with electrons and nuclei bound within the slit material. Although these interactions are extremely small, they may influence interference behavior, phase shifts, decoherence, scattering, and momentum exchange.

Examples of electromagnetic interactions include:

- ☑ Coulomb interaction between the passing particle and slit-bound electrons.
- ☑ Momentum transfer causing tiny recoil effects in the slit material.
- ☑ Induced polarization of atoms near the slit edges.
- ☑ Electromagnetic phase shifts such as the Aharonov–Bohm effect.
- ☑ Excitation of surface electrons and plasmons in conductive materials.
- ☑ Weak bremsstrahlung radiation caused by particle deflection.
- ☑ Casimir-Polder and van der Waals interactions near surfaces.
- ☑ Quantum electrodynamics interactions involving virtual photon exchange.

These effects suggest that slit materials may actively participate in quantum interference processes through microscopic electromagnetic coupling with passing particles.

07) Tennis Balls Thought Experiment

Everyone wants to understand how electrons and photons produce fringe interference patterns. However, these processes cannot be observed directly. For this reason, I designed the tennis-ball **thought experiments** to provide a more intuitive and visible way of illustrating the proposed mechanism.

The slit-hole width must be calculated precisely as the diameter value of 10 tennis balls:

Slit-Hole Width = Tennis Ball Diameter × 10

It is also necessary to install attraction sensors on both sides (left and right) of the slit hole to attract the tennis balls during their passage.
As the tennis balls move through the slit, their paths bend toward the side of higher attraction force.

Arrangement:
Attraction Sensors | Slit Hole (Diameter × 10) | Attraction Sensors

Position	**Left side Attraction Force**	**(-) Right side Attraction Force**	**= Net Attraction Force**	**Deflection Angle**
A	10N	1N	**= 9N**	**42.0°**
B	9N	2N	**=7N**	**35.0°**
C	8N	3N	**=5N**	**26.6°**
D	7N	4N	**=3N**	**16.7°**
E	6N	5N	**=1N**	**5.7°**
F	5N	6N	**= (1N)**	**(5.7°)**
G	4N	7N	**= (3N)**	**(16.7°)**
H	3N	8N	**= (5N)**	**(26.6°)**
I	2N	9N	**= (7N)**	**(35.0°)**
J	1N	10N	**= (9N)**	**(42.0°)**

m - Mass of tennis ball – **0.6kg**
Vx – Forward velocity – **10m/s**
L – Slit length – **0.6m (60cm)**
F – Net Attraction Force – ***See the table 03***

Table 03, interference pattern with Angle

The following thought experiments values are for illustration only, not derived from experiment.

When the tennis balls pass close to the left side, the left-side attraction becomes stronger, while the right-side attraction becomes weaker because of the greater distance.

Similarly, when the tennis balls pass close to the right side, the right-side attraction becomes stronger, while the left-side attraction becomes weaker because of the greater distance.

Note 02: According to the tennis-ball experiment, approximately **50%–70%** of the tennis balls contribute to the formation of a clear interference pattern, while the remaining **30%** may not contribute significantly to the formation of the pattern.

In my opinion, a similar percentage distribution may also apply to experiments in which electrons are fired one by one.

Example calculation (Position A)

For a net attraction force of **9N**:

$$\tan(\theta) = \frac{9 \times 0.6}{0.6 \times 10^2} = \frac{5.4}{6} = 0.9$$

$$\theta = \tan^{-1}(0.9) = \approx 42.0°$$

When one tennis ball passes through "Position A," the tennis ball bends toward the left at an angle of **42.0°**. The reason is that a higher attraction force produces a larger bending angle.

A similar thought experiment can also be carried out using ***electrons*** as the source.

In this experiment, when a tennis ball passes through "Position A," it bends toward to the right at an angle of **42.0°.** The larger bending angle is caused by a stronger repulsive force.

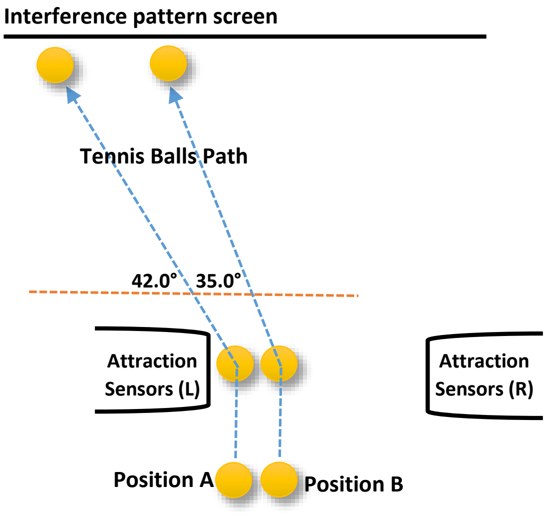

Figure 03, Tennis ball thought experiment

08) The Path of Photons and Electrons inside the Slit Hole

08, *i*) Photons:

According to this proposal, photons do not directly repel other photons. Nevertheless, tiny quantum photon-photon scattering effects cannot be completely excluded. It is hypothesized that photons may propagate with distinct separations from neighboring photons rather than occupying exactly the same position.

One reason for this behavior may be the formation of a clear interference pattern. Another reason may be that, in a laser light beam, photons travel along the same continuous path while maintaining a definite separation from other photons.

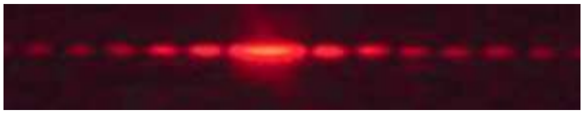

Figure 04, Path of Photons inside the Slit Hole

Note 03: According to standard physics, neutrons and photons have no electric charge, but

1) A neutron is electrically neutral, but it is not neutral with respect to the strong force because its constituent quarks carry color charge.

2) A photon is neutral with respect to electric charge and has no rest mass, but it is not exempt from the effects of space-time curvature produced by mass and energy.

Therefore, we cannot completely ignore the possibility of photon-photon repulsion. According to standard physics, photons do not normally repel each other because they are electrically neutral. However, quantum electrodynamics allows rare photon-photon interactions through virtual charged particles, which can produce tiny scattering effects under extreme conditions.

08, *ii*) Electrons:

In real single-slit and double-slit experiments, an interference pattern emerges even when electrons are fired one by one, with no other free electrons passing through the slit at the same time. According to this proposal, the incoming electrons may still interact electromagnetically with the electrons bound within the slit material. As a result, the bound electrons in the slit may exert a repulsive force on the incoming electrons, influencing their trajectories even when they are sent through the apparatus individually.

When electrons are fired one by one, they move through different positions within the slit opening. According to this proposal, approximately **50%–70%** of the electrons contribute to the formation of a clear interference pattern.
From Table 03: These electrons travel through specific positions such as "Position A," "Position B," and "Position C."

Meanwhile, the remaining **30%** of electrons may not contribute to the formation of the interference pattern.
From Table 03: These electrons travel through the intermediate regions between Positions A and B, or between Positions B and C.

In this model, the result arises from the fact that the electrons are sent through the slit one by one.

Figure 05, Path of Electrons inside the Slit Hole

Note 04: I would like to emphasize that, according to accepted quantum theory, directly observing electrons with photons is not straightforward. Likewise, observing photons using other photons is also challenging. In this proposal, when photons are used to observe electrons or other photons, the interaction may introduce uncertainty into the system, leading to an uncertain observational outcome.

09) Slit-Hole Length

According to our proposal, a slit hole with a greater length creates a larger interference pattern for photons because a longer slit provides more opportunities for electromagnetic attraction interactions.
In contrast, a shorter slit hole creates a smaller or weaker interference pattern because there are fewer opportunities for these electromagnetic attraction interactions to occur.

Another possible reason is that the electrons on both sides of the slit electromagnetic repel the electrons on the opposite side. As a result, the electrons may not strongly electromagnetic attract the photons. Consequently, the photons create only a single spread interference pattern.

W= 0.08 mm

W= 0.04 mm

W = 0.02 mm

Figure 06, Slit-Hole Length

According to this proposal, interference patterns can be produced not only by photons and electrons, but also by atoms and even large molecules. The suggested reason is that electrons exist on both the left and right sides of the slit, and these electrons create electromagnetic attractive or electromagnetic repulsive interactions with the passing particles.

This idea differs from the comparison with water waves. In water-wave experiments, the slit width is not always critically important, and even a small slit can still produce wave patterns. However, in this proposal, the slit width becomes very important because the electrons around the slit influence photons, electrons, atoms, and large molecules through electromagnetic attraction and electromagnetic repulsion effects.

According to this interpretation, this observation provides evidence supporting the slit-length size determining the total number of bright and dark fringes.

Note 05: Photons are electrically **neutral**, yet they can still interact with electrons through electromagnetic processes. Likewise, when **neutral** atoms, large molecules, or neutrons pass through a slit, the charged particles within the slit-wall material may exert electromagnetic forces on the charged constituents of those particles, potentially influencing their trajectories.

10) White Light Double-Slit Experiment

As per the standard physics, violet light has the shortest wavelength and the highest frequency in the visible spectrum, giving it higher photon energy than other visible colors. Because the refractive index of most transparent materials is greater for shorter wavelengths, violet light is refracted (bent) more strongly than red light. Red light, with its longer wavelength and lower frequency, is refracted less and therefore bends the least among the visible colors.

According to our proposal, the photons that form the central white fringe experience zero net attraction. At the center of the aperture, the influences from the left and right sides of the slit material are equal and opposite, causing their attractions to balance each other. As a result, the net attraction at the midpoint is effectively zero.

Because there is no net attraction toward either side, the photons continue along the central path and produce the bright central white fringe on the screen.

The observed central white fringe therefore provides evidence, within our proposed model, that the slit material on the left and right sides exerts equal influences on the photons. The symmetry of these influences leads to zero net attraction at the center, resulting in the formation of the central white bright fringe.

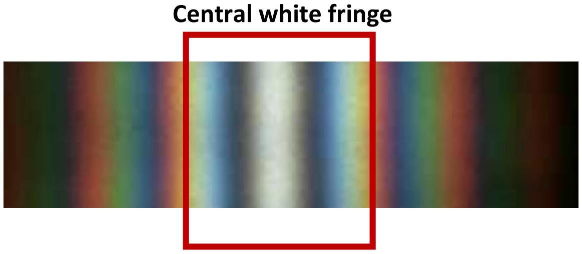

Figure 07, central white fringe in sun light double-slit experiment

According to our proposal, the first bright fringe bends toward the red-photon side before the violet-photon side. In this model, red photons possess lower energy and therefore experience a stronger attraction from the electrons in the slit material. As a result, red photons are deflected more strongly than violet photons.

This prediction is opposite to that of standard physics, where red light is refracted more strongly than violet light. (Standard physics is violet light is refracted more strongly than red light because violet light has a shorter wavelength and experiences a higher refractive index.)

Within our proposed model, the observed first fringe provides evidence that the interaction between photons and the slit material depends on photon energy. Lower-energy red photons experience a greater attraction from the slit-material electrons, while higher-energy violet photons experience a weaker attraction. Consequently, photons of different energies are deflected by different amounts. This energy-dependent attraction causes white light to spread into its constituent colors, with red photons bending more strongly and violet photons bending less strongly.

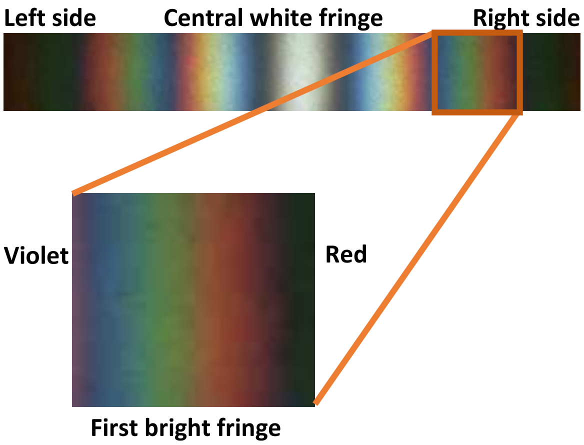

Figure 08, first bright fringe in sun light double-slit experiment

According to our proposal, if photons behaved purely as waves, every bright fringe would contain the full spectrum of white light. During wave interference, energy is redistributed but not separated according to photon energy. Therefore, all bright fringes would be expected to remain white.

However, the observed fringes display color separation, with photons appearing to distribute according to their energies. This suggests that photons of different energies follow different paths and are deflected by different amounts. Within our proposed model, this energy-dependent separation produces the observed color pattern, indicating that the fringes are formed by photons sorting according to energy rather than by wave interference alone.

11) The Observer Effect

In a typical interaction, a traveling photon strikes a material, and the material absorbs part of the photon's energy. The photon may then be reflected by the material, which is a common physical process. According to our proposal, a similar process occurs in the detector.

Photons:

When a single photon reaches the detector, the detector absorbs a significant portion of the photon's energy. The photon is then reflected back along the same path because the detector provides only one available path for its motion.

As a result, the reflected photon travels back toward the slit. Since the detector has absorbed much of its energy, the returning photon possesses considerably less energy than the incoming photon. Furthermore, photons are now traveling in opposite directions—toward the detector and back toward the slit.

Within our proposed model, this bidirectional photon motion weakens or disrupts the electromagnetic attraction associated with the slit. Because photons are moving both into and out of the slit region, the attractive effect is reduced or canceled. Consequently, the mechanism responsible for producing the interference pattern breaks down.

Therefore, according to our proposal, the presence of the detector alters the photon–slit interaction, suppresses the electromagnetic attraction, and causes the interference pattern to disappear.

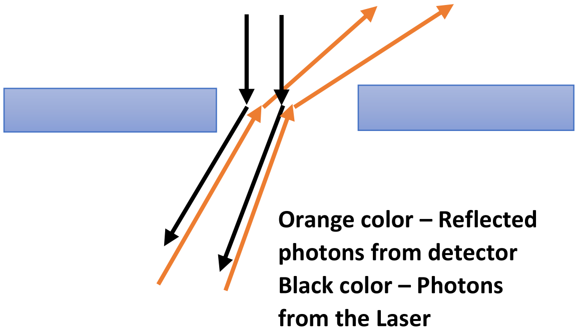

Figure 09, photons move both in and out of the slit

According to our proposal, the interference pattern may reappear if photons reflected from the detector can be completely eliminated. If the detector absorbs all of the photon energy and prevents any photons from being reflected back toward the slit, the electromagnetic balance around the slit-hole would remain undisturbed.

In this scenario, the detector would not introduce any returning photons that could alter the electromagnetic attraction associated with the slit. As a result, the original conditions responsible for producing the interference pattern would be preserved, allowing the interference fringes to appear.

Electrons:

Electron detector based on electric charges or photons disturbs the electromagnetic balance that exists around the slit-hole. Under normal conditions, the slit-hole contains a balance between electromagnetic attraction and electromagnetic repulsion, which contributes to the formation of the interference pattern.

When an electric-charge detector is placed near the slit, the detector's microscopic wire gate introduces additional electromagnetic repulsion. This extra repulsive influence disrupts the existing balance at the slit-hole. As a result, the conditions required for the interference pattern are no longer maintained, and the interference pattern disappears.

Similarly, when photons are used in the electron detector, the detector photons introduce additional electromagnetic attraction near the slit-hole. This added attraction alters the original electromagnetic balance between the slit and the passing particles. Once this balance is disturbed, the mechanism responsible for generating the interference pattern is disrupted, causing the interference pattern disappears.

Final Suggestion: Another possible way to test the mechanism is to send photons through the slit-hole with large time intervals between them.

In this scenario, photons reflected from the detector return to the slit region with very low energy. According to the model, these low-energy photons interact with electrons in the slit material and draw energy from them, causing the electrons to become less energetic over time.

After a sufficient delay, a new photon is emitted from the laser source and travels toward the slit. However, because the electrons in the slit material have already lost some of their energy, their ability to attract the incoming photon is reduced. As a result, the electromagnetic attraction responsible for guiding the photon weakens or breaks down.

Within this proposed framework, the reduction of electron energy leads to a disruption of the photon–slit interaction. Consequently, the conditions required for producing the interference pattern are no longer maintained, and the interference pattern disappears.

12) Observation

Finally, our proposer that photons travel as particles and electrons also travel as particles.

This idea can be highlighted through the single-slit and double-slit experiments, where photons and electrons appear to exhibit electromagnetic attractive and electromagnetic repulsive interactions.

According to this new proposal, the confusion regarding the behavior of electrons and photons can be resolved.

Author's Note: This research work was completed under deep challenging circumstances in Linz Austria. I sincerely appreciate the reader's understanding of any limitations that may be present.

Thank you for your time, patience, and interest in this research. Your consideration is greatly appreciated.

Thank you for reading research!

Authors Contact Details:

Email: kasunhtf@gmail.com & kasunhf@yahoo.com.br

Home Address: No. 412/C Batagama South, Kandana,
Sri Lanka

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