Misunderstanding the Interference Pattern Behavior in the Double-Slit Experiment – 02 (Mathematical Analysis Based On Real Experiment)

Kasun Thilina Fernando

kasunhtf@gmail.com

Article

This research is the second part of the first study. The first study introduced the proposed concept, presented several mathematical explanations, and interpreted some other of experiments using the new theoretical framework.

The present study extends that work by providing a complete mathematical analysis of one representative experiment. In addition, several other experiments are discussed and interpreted within the same proposed framework, further illustrating the application of the new concept.

Abstract: The double-slit experiment was first performed by Thomas Young in 1801 and has been studied for more than two centuries. According to the interpretation proposed in this work, these experiments do not demonstrate wave behavior. Instead, they are interpreted as evidence of electromagnetic attraction and repulsion.

If this interpretation is correct, then many theories developed from the conventional wave interpretation may require re-examination. Since numerous well-established theories have been supported by extensive mathematical development, reconsidering the underlying interpretation of these experiments presents a significant scientific challenge.

I understand that my proposal may not be accepted today, as current scientific thinking is largely based on the established observational framework only. Nevertheless, I believe that future generations may re-examine these experiments with fresh perspectives and open minds, and may eventually recognize the value of this alternative interpretation. If this research remains preserved in cyberspace over the long term, it could serve as a foundation for future scientists to investigate these ideas further and evaluate them on the basis of new evidence and discoveries.

Keywords: *(1)* Quantum mechanics, *(2)* Double slit experiment, *(3)* Single-slit diffraction, *(4)* Electron-photon interaction, *(5)* Slit-boundary interactions, *(6)* Quantum foundations

Simple Logic:

Consider the following simple analogy. Imagine that you and a friend each have five balls.

- First, both of you throw away one ball. The total number of balls remaining is eight.
- Next, you both start again with five balls each. This time, each of you throws away two balls. The total number of balls remaining is six.
- Again, you both begin with five balls each and each throws away three balls. The total number of balls remaining is four.

If you and your friend always remove the same number of balls simultaneously, the total number of balls remaining will always be an even number. Totals such as 9, 7, 5, 3, or 1 can never occur.

According to this proposal, this simple logic serves as an analogy for understanding the formation of fringe interference patterns. The pattern emerges because certain outcomes are reinforced, whereas other outcomes do not occur. As a result, a structured distribution is produced rather than a random one.

(This very simple analogy is an original concept presented in my first research.)

1) The Deflection Angle Based on Newtonian Mechanics

Symbol	Description	Unit
θ	Deflection angle	Degrees or radians
F	Net sideways force (attraction - repulsion	N

w	Slit width (distance between the left and right slit walls). This parameter was previously defined as slit length (L) in the first research and is corrected here.	m
m	Mass of the particle	Kg
Vx	Forward velocity	ms^{-1}

Step 1 - Newton's Second Law:
A net sideways force **F** causes a sideways acceleration: **ay**

$$ay = F / m$$

Step 2 - Interaction time:
The particle travels through the slit of width $\mathbf{w}$ at constant forward velocity $\mathbf{Vx}$
The time inside the slit is:

$$t = w / Vx$$

Step 3 - Sideways velocity after the slit:
Starting from zero sideways velocity $\mathbf{Vy}$

$$Vy = ay \,.\, t$$

$$Vy = F/m \,.\, w/ Vx$$

Step 4 - Resultant direction angle
After exiting the slit, the particle has:

Forward velocity $\mathbf{Vx}$
Sideways velocity $\mathbf{Vy}$

The deflection angle is given by trigonometry:
$\tan(\theta) = Vy / Vx$

*Substitute **Vy** from Step 3:*
$\tan(\theta) = (F/ m \,.\, w/ Vx) / Vx$

Step 5 - Simplify
$\tan(\theta) = F/ m \,.\, w/ V^2x$

Therefore:

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

The original formula is a general expression derived for particles with mass. Therefore, it can be directly applied to electrons, but it cannot be applied to photons in the same way.

For photons, the formula is modified by removing the mass term, since photons have zero rest mass, and replacing it with the energy relation E = hf.

Although our new proposal treats photons as particles, it is important to present the derivation in a way that is consistent with the established framework of physics. For this reason, I use the relation E = hf, as it is the accepted and experimentally verified expression for photon energy.

2) The derivation to remove mass (*m*) and replace *E = hf*

Symbol	Description	Unit
E	Energy of the photon	Joules (J)
h	Planck's constant 6.626×10^{-34}	J·s
f	Frequency of the light	Hz
c	light speed/photon velocity 2.99×10^{8}	ms^{-1}

Step 1: Start with the original formula

$$\theta = \tan^{-1} (F \cdot w / (m \cdot v^2)$$

Step 2: Replace mass (m) with the photon's relativistic mass

For a photon moving at speed **c:**

$$m = E / c^2$$

Substitute this in:

$$\theta = \tan^{-1} (F \cdot w / ((E / c^2) \cdot v^2))$$

Step 3: Since the photon travels at $\mathbf{v = c}$, replace $\mathbf{v^2}$ with $\mathbf{c^2}$

$$\theta = \tan^{-1} (F \cdot w / ((E / c^2) \cdot c^2))$$

Step 4: Simplify the denominator - $\mathbf{c^2}$ cancels out

$$\theta = \tan^{-1} (F \cdot w / E)$$

Step 5: Add photon energy $E = hf$

$\theta = \tan^{-1} (F \cdot w / (h \cdot f))$

Final formula (mass-free):

$$\boxed{\theta = tan^{-1}\left(\frac{F\ .\ w}{hf}\right)}$$

3) Determination of the Sideways Force (F)

Given:

$\theta = \tan^{-1} (F . w / h . f)$

Step 1: Rearrange for F

Take the tangent of both sides:

$\tan(\theta) = F . w / h . f$

So:

$$F = \frac{h . f . \tan(\theta)}{w}$$

The data presented here represent a typical set of laboratory measurements obtained using a red He–Ne laser with a wavelength of *632.8 nm.*

The measured angular positions of the bright fringes in a single-slit diffraction experiment are listed below for left side.

Bright Fringe	Exact β	Angular Position (θ)
Central maximum	0.000	0.000°
First left side maximum	4.493	0.435°
Second left side maximum	7.725	0.748°
Third left side maximum	10.904	1.056°
Fourth left side maximum	14.066	1.362°

Example Calculation:

For the first left side maximum

Exact value: β = 4.493
Measured diffraction angle: θ = 0.435°

This angle is used as the representative value for the first bright side maximum in the subsequent calculations.

Since the formula uses frequency, I'll first convert wavelength to frequency using:

$f = c / \lambda$

Where $c = 3.00 \times 10^{8}$ m/s

Convert wavelength to meters

$\lambda = 632.8$ nm $= 632.8 \times 10^{-9}$ m
$\lambda = 6.328 \times 10^{-7}$ m

Calculate frequency $f = c / \lambda$

$f = 3.00 \times 10^{8} / 6.328 \times 10^{-7}$
$f = 4.74 \times 10^{14}$ Hz

Step 2: List known values

Planck's constant: $h = 6.626 \times 10^{-34}$ J·s
Frequency red He–Ne laser: $f = 4.74 \times 10^{14}$ Hz
Slit width: $w = 0.12$ mm $= 0.12 \times 10^{-3}$ m
$w = 1.2 \times 10^{-4}$ m
Deflection angle: $\theta = 0.435°$
Convert to radians: $\theta = 0.435 \times \pi / 180$
$\theta \approx 7.592 \times 10^{-3}$ rad

Step 3: Compute $\tan(\theta)$

$\tan(7.592 \times 10^{-3}) \approx 7.592 \times 10^{-3}$

Step 4: Plug into the formula

$F = h .\ f . \tan(\theta) / w$

$$F = \frac{(6.626 \times 10^{-34}) . (4.74 \times 10^{14}) . (7.592 \times 10^{-3})}{1.2 \times 10^{-4}}$$

First, numerator:

$6.626 \times 10^{-34} \times 4.74 \times 10^{14}$
$= 3.140724 \times 10^{-19}$

Multiply by 7.592×10^{-3}:

$3.140724 \times 10^{-19} \times 7.592 \times 10^{-3}$
$\approx 2.3844 \times 10^{-21}$

Now divide by 1.2×10^{-4}

$F \approx 2.3844 \times 10^{-21} / 1.2 \times 10^{-4}$
$= 1.987 \times 10^{-17}$ N

Final answer: 1.987×10^{-17} N

F0) Central maximum: 0

First left side maximum: $(0.435°)$
F1)Left sideway forces <--- 1.987×10^{-17}N

Second left side maximum: $(0.748°)$
F2) Left sideway forces <--- 3.418×10^{-17}N

Third left side maximum: $(1.056°)$
F3) Left sideway forces <-- 4.826×10^{-17}N

Fourth left side maximum: $(1.362°)$
F4) Left sideway forces <-- 6.227×10^{-17}N

Important Note**:** All experimental measurements are reported to three or four decimal places. Because it is extremely difficult to measure the diffraction angle with perfect precision, even a very small variation in the measured angle can produce a significant difference in the calculated results. Therefore, minor discrepancies in the angular measurements, such as differences of approximately **±0.3°** (or the corresponding small differences in the reported decimal values), should be regarded as experimental uncertainty and do not affect the overall conclusions of this study.

4) The Average with one Hide Sideways Forces and Unit value.

The first step is to calculate the difference between the sideways forces for each measurement and then determine the average of these differences.

$F4 - F3 = 6.227 \times 10^{-17} - 4.826 \times 10^{-17}$
$F4 - F3 = 1.401 \times 10^{-17}$

$F3 - F2 = 4.826 \times 10^{-17} - 3.418 \times 10^{-17}$
$F3 - F2 = 1.408 \times 10^{-17}$

$F2 - F1 = 3.418 \times 10^{-17} - 1.987 \times 10^{-17}$
$F2 - F1 = 1.431 \times 10^{-17}$

Average:

$$\frac{1.401 \times 10^{-17} + 1.408 \times 10^{-17} + 1.431 \times 10^{-17}}{3}$$

Average $= 1.413 \times 10^{-17}$
(The sideways force difference average)

Why Calculate the Sideways Force Difference Average?

The sideways force difference average is calculated for the following reasons:

4,a) ***Hidden Sideways Forces:***
Comparison with the Average of "**F1**":
The average difference is compared with the average value of "**F1**". If the average value of "**F1**" is greater than the sideways force difference average, this suggests that additional hidden sideways force components may be present within the measured values.

$F1 - \text{Average} = F0$
$F0 = 1.987 \times 10^{-17} - 1.413 \times 10^{-17}$
$F0 = 0.574 \times 10^{-17}$

$F0 = 5.74 \times 10^{-18}$ *(Hidden sideways forces)*

4,b) ***Unit Value:***
Determination of the Unit Value:
The unit value of the sideways force can be estimated by dividing the sideways force difference average by two. This provides a representative force increment for subsequent analysis.

$\text{Unit value} = \text{Sideways force difference average} / 2$

Unit value $= 1.413 \times 10^{-17}/2$

Unit value $= 7.065 \times 10^{-18}$

5) Hidden Sideways Forces ($F0 = 5.74 \times 10^{-18}$ N) Angle Calculation.

Formula

$\theta = \tan^{-1} (F . w / h . f)$

$\lambda = 632.8$ nm

$h. f = 3.141 \times 10^{-19}$ J

$w = 1.2 \times 10^{-4}$ m

Plug values into the formula

$\theta = \tan^{-1} ((5.74 \times 10^{-18}) \times (1.2 \times 10^{-4})/3.141 \times 10^{-19})$

$\theta = 2.193 \times 10^{-3}$ radians

Convert to degrees

$\theta = 2.193 \times 10^{-3} \times (180/\pi)$

$\theta = 2.193 \times 10^{-3} \times 57.2958$

$\theta = 0.1256°$

$F0 = 0.126°$

6) The Complete Table of Angle and Sideways force

Figure	Angle	Sideways Forces	Pattern
Left Side			
F4	1.362°	6.227×10^{-17}N	
F3	1.056°	4.826×10^{-17}N	
F2	0.748°	3.418×10^{-17}N	
F1	0.435°	1.987×10^{-17}N	
FO *	0.126°	5.74×10^{-18} N	
Central	0.0°	0.0N	
Right Side			
(F0) *	(0.126°)	(5.74×10^{-18} N)	
(F1)	(0.435°)	(1.987×10^{-17}N)	
(F2)	(0.748°)	(3.418×10^{-17}N)	
(F3)	(1.056°)	(4.826×10^{-17}N)	
(F4)	(1.362°)	(6.227×10^{-17}N)	

* Hidden angle

Table 01, The Complete Table of Angle and Sideways force

7) How to visualize electromagnetic attraction/repulsion fringe interference patterns algorithm?

The fringe interference pattern algorithm is determined by dividing the sideways force by the unit value. Accordingly, the proposed algorithm is

Fringe Interference Pattern Algorithm = (Sideways Force \ Unit Value)

In simple terms, the number corresponding to the fringe interference pattern algorithm is obtained by dividing the sideways force by the unit value.

Two primary algorithms are identified in this study. According to the proposed model, these algorithms determine the formation of the fringe interference pattern.

For simplicity and ease of understanding, the decimal values have been omitted from the algorithms presented here. However, the actual calculations are performed using the full numerical values, including the decimal components.

Odd Algorithm 01

Left side attraction/repulsion - Right side attraction/repulsion = Electromagnetic Net attraction/repulsion (Sideways force)

	Left	Right	
F4	10	-1	= 9
F3	9	-2	= 7
F2	8	-3	= 5
F1	7	-4	= 3
F0	6	-5	=1
(F0)	5	-6	= (1)
(F1)	4	-7	= (3)
(F2)	3	-8	= (5)
(F3)	2	-9	= (7)
(F4)	1	-10	= (9)

Table 02, Odd Algorithm

Even Algorithm 02

Left side attraction/repulsion- Right side attraction/repulsion = Electromagnetic Net attraction/repulsion (Sideways force)

	Left	Right	
F4	9	-1	= 8
F3	8	-2	= 6
F2	7	-3	= 4
F1	6	-4	= 2
F0	5	-5	= 0
(F1)	4	-6	= (2)
(F2)	3	-7	= (4)
(F3)	2	-8	= (6)
(F4)	1	-9	= (8)

Table 03, Even Algorithm

According to the proposed model, interference patterns produced in single-slit or double-slit experiments whether using photons, electrons, or other particles are governed by two fundamental algorithms.

To visualize these algorithms, the sideways force is divided by the unit value:

Key Characteristics of the Algorithm

The proposed algorithms exhibit the following characteristic:

- The difference between successive net attraction/repulsion values is always equal to 2.
- This difference remains constant throughout the sequence; it neither increases nor decreases.
- Consequently, the constant difference of 2 forms a fundamental property of the proposed interference-pattern algorithm.

8) Finally, the experimental investigation reached a critical milestone, where the proposed algorithm was visualized through the experimental results.

Figure	Net Sideways Forces (N)	Net Sideways Forces / Unit Value* = Algorithm	Difference F-F =
Left Side			
F4	6.227×10^{-17}	6.227×10^{-17}/ 7.065×10^{-18} = **8.813**	F4-F3 = **1.983**
F3	4.826×10^{-17}	4.826×10^{-17}/ 7.065×10^{-18} = **6.830**	F3-F2 = **1.993**
F2	3.418×10^{-17}	3.418×10^{-17}/ 7.065×10^{-18} = **4.837**	F2-F1 = **2.025**
F1	1.987×10^{-17}	1.987×10^{-17}/ 7.065×10^{-18} = **2.812**	F1-F0 = **2.000**
F0	5.74×10^{-18}	5.74×10^{-18} / 7.065×10^{-18} = **0.812**	
Central	0.0 N	F0 - 0 (Zero) =0	
Right Side			
(F0)	(5.74×10^{-18})	(5.74×10^{-18}) / 7.065×10^{-18} = **(0.812)**	
(F1)	(1.987×10^{-17})	(1.987×10^{-17})/ 7.065×10^{-18} = (**2.812**)	F0-F1 = **2.000**
(F2)	(3.418×10^{-17})	(3.418×10^{-17}) / 7.065×10^{-18} = **(4.837)**	F1-F2 = **2.025**
(F3)	(4.826×10^{-17})	(4.826×10^{-17})/ 7.065×10^{-18} = **(6.830)**	F2-F3 = **1.993**
(F4)	(6.227×10^{-17})	(6.227×10^{-17}) 7.065×10^{-18} = **(8.813)**	F3-F4 = **1.983**

***** Unit value = 7.065×10^{-18}

Table 04, Algorithm visualization through the experiment

The even-number algorithm can be identified through careful examination of the calculated values. A key characteristic of this algorithm is that the difference between successive net attraction values remains consistently close to **2**.

What Is the Unit Value?

In the proposed model, the unit value is defined as the minimum quantum sideways force in this experiment.

(This experiments unit value is 7.065×10^{-18})

The electromagnetic attraction or repulsion exerted by the left or right edge of the slit is assumed to consist of discrete minimum quantum contributions. The magnitude of one such minimum contribution is defined as the unit value.

According to the proposed model, the unit value depends on the width of the slit. Consequently, any change in the slit width results in a corresponding change in the experimentally determined unit value.

9) Sideways Forces Scale

To explain the proposed model more clearly, we introduce a new concept called the Side Force Scale. This scale provides a framework for understanding the relationships among the following key components:

1. The algorithms
2. The unit value
3. The hidden sideways force
4. The net sideways force
5. The total electromagnetic attraction/repulsion (Ft)

Within this framework, the total force is remain constant and is expressed as

Ft = k

Where (k) is a constant representing the total electromagnetic attraction/repulsion in the proposed model.

How the scale works

First consider the case of F4 Two values are available from the calculation:

1. Net sideways force: **6.227 x 10^{-17}N**
2. Algorithm value: **8.813**

To identify the corresponding algorithm, only the first digit of the algorithm value is considered, while the decimal part is ignored. Since the first digit is 8, this corresponds to the even algorithm.

The even algorithm can be verified using the net sideways force value of 8, which is obtained from the left and right side contributions as follows:

(F4) 9 - 1 = 8 or equivalently,

(F4) Left side 9 - Right side 1 = Net 8

According to the proposed model, the difference between the left-side and right-side contributions determines the algorithm value associated with the net sideways force.

Constructing the Side Force Scale

The Side Force Scale is constructed using the following procedure.

Left Side of the Scale

Step 1 *– Apply the Unit Value*

According to the even algorithm, the unit value is multiplied by 9 and assigned to the left side of the scale.

Step 2 *– Apply the Hidden Sideways Force*
The hidden sideways force is then added to the left side of the scale.

The total electromagnetic attraction/repulsion on the left side is therefore

Left-side total = (9 x Unit Value) + (Hidden Sideways Force)

Right Side of the Scale

Step 3 – Apply the Unit Value

According to the even algorithm, the right side of the scale consists of one unit value.

Thus, the total electromagnetic attraction/repulsion on the right side is

Right-side total = (1 x Unit Value)

Results Obtained from the Side Force Scale
Using the completed scale, the following quantities can be determined:

1. Net sideways force

Net Sideways Force = (Left-side total) - (Right-side total)
According to the proposed model, this calculation yields the same value as the measured net sideways force, F4

2. Total electromagnetic attraction/repulsion

The total electromagnetic attraction/repulsion is assumed to remain constant within the proposed model.

Scale F4:

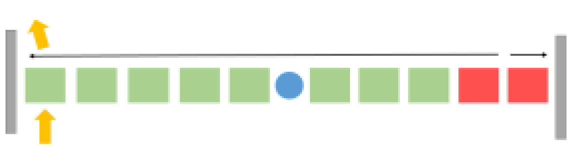
Algorithm:		
F4	**9 - 1**	**= 8**

Left side
Unit Value
$(7.065 \times 10^{-18}) \times 9$
$= 6.358 \times 10^{-17}$
Hidden sideways force
$= 5.74 \times 10^{-18}$
Total left side force
$= 6.932 \times 10^{-17}$

Right side
Unit Value
$(7.065 \times 10^{-18}) \times 1$
$= 7.065 \times 10^{-18}$
Total right side force
$= 7.065 \times 10^{-18}$

F4 Scale net sideways forces:
$(6.932 \times 10^{-17}) - (7.065 \times 10^{-18})$
$= 6.226 \times 10^{-17}$ N (Left Side)
The total electromagnetic attraction/repulsion force inside the slit hole:
$(6.932 \times 10^{-17}) + (7.065 \times 10^{-18})$
$= 7.638 \times 10^{-17}$ N
This value constant for this experiments

Parameter (F4)



Unit Value
Hidden sideways force
Active sideway forces
Cancelled sideway forces (Left ← & → Right)
Photons Path
Slit

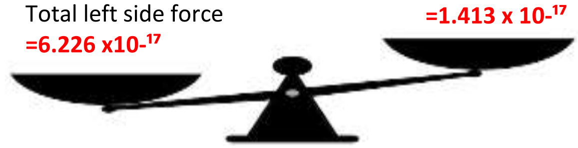
Note 01: The complete construction of the Side Force Scale is presented for F4 as a representative example. For F3, F2, F1, and F0, only the summary values of the scale are provided, since the calculation procedure is identical. Readers who require the full computational details should refer to the F4 example.

Scale F3:

Algorithm:		
F3	**8 - 2**	**= 6**

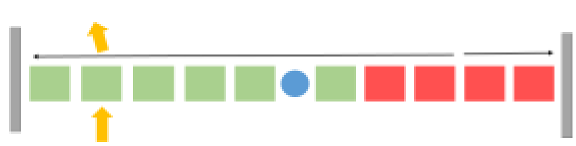
Left side
Unit Value:
$(7.065 \times 10^{-18}) \times 8$
$=5.652 \times 10^{-17}$
Hidden sideways force
$=5.74 \times 10^{-18}$
Total left side force
$=6.226 \times 10^{-17}$

Right side
Unit Value
$(7.065 \times 10^{-18}) \times 2$
$=1.413 \times 10^{-17}$
Total right side force
$=1.413 \times 10^{-17}$



F3 Scale net sideways forces:
$(6.226 \times 10^{-17}) - (1.413 \times 10^{-17})$
$= 4.813 \times 10^{-17}$N (Left Side)
The total electromagnetic attraction/repulsion force inside the slit hole:
$(6.226 \times 10^{-17}) + (1.413 \times 10^{-17})$
$= 7.639 \times 10^{-17}$N
This value constant for this experiments

Parameter (F3)



Scale F2:

Algorithm:		
F2	**7 - 3**	**= 4**

Left side
Unit Value:
(7.065×10^{-18}) x 7
=4.945×10^{-17}
Hidden sideways force
=5.74×10^{-18}
Total left side force
=5.519×10^{-17}

Right side
Unit Value
(7.065×10^{-18}) x 3
=2.119×10^{-17}
Total right side force
=2.119×10^{-17}

F2 Scale net sideways forces:
(5.519×10^{-17}) - (2.119×10^{-17})
=3.399×10^{-17}N (Left Side)
The total electromagnetic attraction/repulsion force inside the slit hole:
(5.519×10^{-17}) + (2.119×10^{-17})
=7.638×10^{-17}N
This value constant for this experiments

Parameter (F2)

Scale F1:

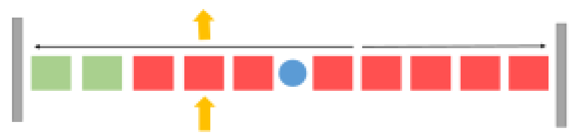
Algorithm:		
F1	**6 - 4**	**= 2**

Left side
Unit Value:
(7.065×10^{-18}) x 6
=4.239×10^{-17}
Hidden sideways force
=5.74×10^{-18}
Total left side force
=4.813×10^{-17}

Right side
Unit Value
(7.065×10^{-18}) x 4
=2.826×10^{-17}
Total right side force
=2.826×10^{-17}

F1 Scale net sideways forces:
(4.813×10^{-17}) - (2.826×10^{-17})
=1.987×10^{-17} N (Left Side)
The total electromagnetic attraction/repulsion force inside the slit hole:
(4.813×10^{-17}) + (2.826×10^{-17})
=7.639×10^{-17}N
This value constant for this experiments

Parameter (F1)



Scale F0:

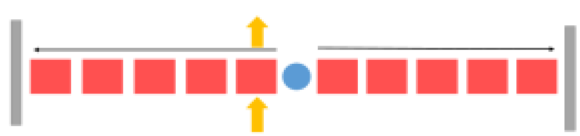
Algorithm:		
F1	**5 - 5**	**= 0**

Left side
Unit Value:
(7.065×10^{-18}) x 5
=3.532×10^{-17}
Hidden sideways force
=5.74×10^{-18}
Total left side force
=4.106×10^{-17}

Right side
Unit Value
(7.065×10^{-18}) x 5
=3.532×10^{-17}
Total right side force
=3.532×10^{-17}

F0 Scale net sideways forces:
(4.106×10^{-17}) - (3.532×10^{-17})
=5.74×10^{-18} N
The total electromagnetic attraction/repulsion force inside the slit hole:
(4.106×10^{-17}) + (3.532×10^{-17}) =
=7.638×10^{-17}N
This value constant for this experiments

Parameter (F0)

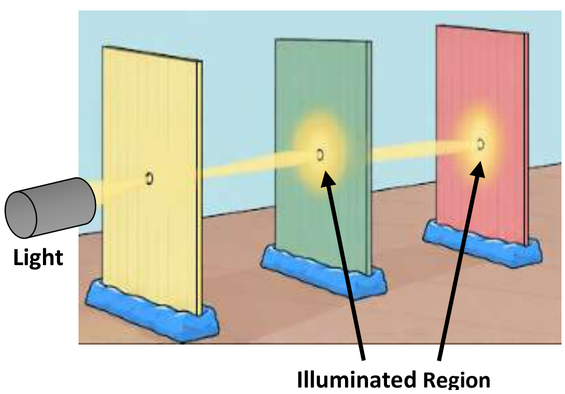


10) Experiment: Light Travels in a Straight Path

In the proposed model, this experiment is interpreted from a different perspective than the conventional explanation.

As illustrated in the figure, a beam of light first passes through the yellow aperture and then reaches the green aperture. An important observation is that the illuminated spot formed at the green aperture is larger than the diameter of the original yellow aperture.

Several factors may contribute to the formation of an illuminated region at the green aperture. However, based on the green aperture an illuminated region at the red aperture itself would not be expected. In the actual experiment, however, an illuminated region is observed at the red aperture.



<u>Figure 01</u>, Light Travels in a Straight Path

Proposed Observation

According to the proposed model, the light beam undergoes a slight deflection as it passes near the green aperture. Although this deflection may be very small, it is attributed to the electromagnetic attraction exerted by electrons located near the edge of the green aperture on the passing photons.

Within the framework of this proposed model, this observation is interpreted as evidence that electrons can attract photons, resulting in a small change in the photons' trajectories.

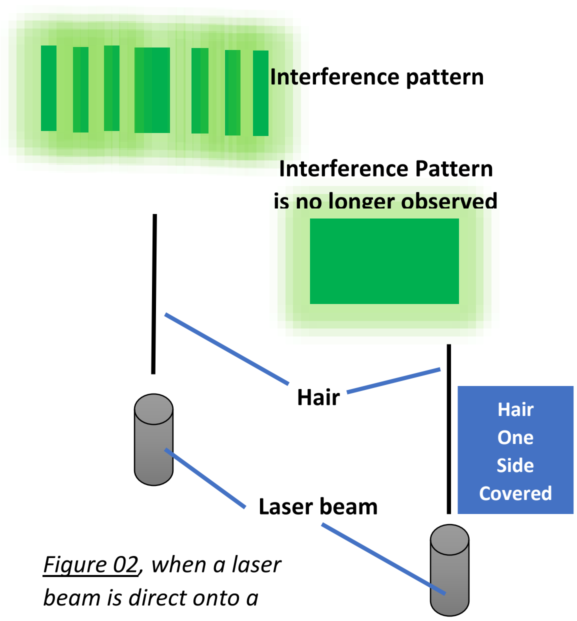
11) Human hair experiments with laser beam

When a laser beam is directed onto a single human hair, an interference pattern similar to that observed in a single-slit diffraction experiment is produced.

According to the proposed model, photons travel on both sides of the hair while interacting with the electrons within the material. The electrons on each side of the hair exert electromagnetic attraction on the passing photons, causing changes in their trajectories.

If the electromagnetic attraction from the electrons on the left side is dominant, the photons passing on that side are deflected inward toward the hair. Likewise, photons passing on the right side are attracted inward by the electrons on the right side. Consequently, photons on both sides are deflected toward the center, resulting in a change in their overall trajectories.

Within the framework of the proposed model, these inward deflections produce the observed fringe interference pattern. The resulting distribution of photons is proposed to resemble the spreading of light produced by a convex lens.



<u>Figure 02</u>, when a laser beam is direct onto a single human hair, an interference pattern is observed

<u>Figure 03</u>, if one side of the hair is covered with an opaque material or paper, the fringe pattern is no longer observed.

Proposed Observation

If one side of the hair is covered with an opaque material, such as paper, the fringe pattern is no longer observed. This suggests that contributions from both sides are essential for the formation of the fringe pattern. When one side is blocked, the pattern does not form.

According to the proposed model, this observation supports the hypothesis that the fringe pattern arises from the combined electromagnetic attraction and repulsion associated with both sides of the slit or obstacle. In this interpretation, the interaction from only one side is insufficient to produce the complete fringe pattern.

12) Observation:

According to our new proposal, neither photons nor electrons behave as waves. Instead, the observed interference fringe pattern arises from electromagnetic attraction and electromagnetic repulsion between particles, rather than from wave interference.

In this model, electrons can alter the trajectory of photons through electromagnetic attraction.

Proposed Hypotheses:

Furthermore, our model proposes that photons can pass through one another. During the interaction of photons with different energies, a fraction of the energy from a higher-energy photon may be transferred to a lower-energy photon, while both photons continue to propagate after the interaction.

According to our proposed model, photons have no mass and do not exhibit wave-like behavior. Consequently, momentum is not defined for photons within this framework. Instead, photons are characterized by their direction of propagation, velocity, and energy.

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

I had not originally intended to undertake a second research study. However, following the publication of my first paper, several respected readers encouraged me to provide mathematical derivations and supporting analyses. Their constructive feedback inspired me to carry out this additional research.

I am grateful for your time, patience, and interest in this work. Your thoughtful consideration of the ideas presented here is sincerely appreciated.

Thank you for reading this research.

Authors Contact Details:

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

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

Period: 20th June 2026 – 10th July 2026
Current Location: ***Linz, Austria***