After Strict Comparison, the Conclusion of the Double-Slit Test Conflicts with the Mathematical Model

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Research Article

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Abstract

Light waves, which have almost no physical properties, are an abstract mathematical concept rather than an objective description. Confused by a set of dark and bright stripes and a sketchy schematic with little relation to the actual result, the double-slit phenomenon was misjudged as being caused by interfering light waves, but this plausible principle implies disastrous flaws. For example, (1) immediately after light passes through the double-slit device, the pattern is generated early or before interference. By changing the device-screen distance, the pattern only scales synchronously without being reconstructed by interference. The pattern with more interference points is darker, but it should be brighter. (2) Light waves can not only be subdivided into many parts but also greatly proliferate. (3) Light waves with missing leading edges outside the screen can still induce much interference. (4) Reflected light waves do not interfere. (5) The effect of polarization direction on interference should not be ignored. (6) Compared with the mathematical model, the location where the dark stripe should appear is actually the brightest spot. The formation principle of multiple regular dark stripes cannot be found. (7) To reflect the quantum property in the interference process, unless all conditions are simultaneously met, interference will not be triggered, and therefore, the principle of interference will be rejected. (8) A light source cannot be produced in a slit that may be in vacuum. (9) In the causality test, to verify the effect of collapse, the photons that have collapsed into particles should be tested again with a double-slit test. (10) The phenomenon of "observed tampering results" is obtained by observation. Has it been tampered with by observation? (11) If light is a wave, then matter and antimatter are conjoined. In conclusion, Newton's particle model is wrong, as is light wave theory.

1. Background

The basic formula of quantum theory is as follows:

$$E=Nhf \qquad (1)$$

where E is the quantum energy, N is a natural number, h is Planck's constant, and f is the frequency.

Note: Planck's constant h is a general constant. For any matter, Planck's constant h is constant. Frequency f is a special constant. Different kinds of matter have their own special frequency constant f, that is, each quantum frequency f is only one unique constant. N is the number of quantum energy components, which is also the number of quanta.

Interference conditions and modes of light waves:

Fig. 2(a) shows the principle of double-slit interference, with solid lines representing wave peaks and dashed lines representing wave troughs. In the original version in Fig. 4(a), only peaks are drawn without troughs, which is obviously incomplete.

Complete light wave interference conditions:

Conditions automatically met include the amplitude.

Under existing conditions, the frequencies (wavelengths) of the light waves involved in interference must be the same.

Under existing conditions, the phase difference of the light waves involved in interference is constant.

Ignored conditions include the necessary conditions so that interference is not triggered. Because the interference process is a quantum phenomenon, it is suddenly triggered only at the moment when all the interference conditions are simultaneously satisfied. Otherwise, the principle of noninterference would not be reasonable.

Ignored conditions also include the role of polarization direction, which cannot be ignored. When light waves with different polarization directions interfere, the results are synthesized by vectors, and the quantum characteristics of light waves are destroyed.

Interference mode:

Overlapping interference caused by simultaneous alignment of the same features. As shown in Fig. 2(a), wave peaks are superimposed at the intersection of two solid lines. At the same time, troughs are superimposed at adjacent points at the intersection of two dotted lines. According to the principle of interference, bright stripes on the screen come from photons generated by superimposed interference.

Simultaneous alignment of different features leads to annihilation interference. In Fig. 2(a), light waves annihilate simultaneously at the intersection of adjacent solid and dotted lines. The interference principle holds that the dark stripes on the screen come from annihilation interference.

Noninterference occurs in other cases.

Water waves, which are often used as analogies, are quite different from light waves.

A water wave contains multiple waves, and the distance between the peaks is the wavelength. However, because light waves are much smaller in size than wavelengths, a wavelength contains an untold number of light waves.

Water waves have no quantum characteristics.

Noninterference will not occur when water waves meet.

Water waves have no polarization.

Positive and negative waves:

Without loss of generality, the mathematical expression of a wave can be given as:

$$u1(t)=A\sin(2\pi ft+\theta 0) \qquad (2)$$

where A is the amplitude, f is the frequency, t is the time, and $\theta 0$ is the initial phase. If the phase is shifted by an odd multiple of π, then the result is reversed:

$$u2(t)=A\sin(2\pi f\ t+\theta 0\pm(2k+1)\pi)=-u1(t) \qquad (3)$$

where k is any integer.

2. Analysis

The principle of light wave interference is in serious opposition to the basic principle of quantum physics

As shown in Fig. 2(a), in general, the width (w in Fig. 2(c)) of a slit (SR or SL in Fig. 2(a)) of a double-slit device is approximately the same as the width of the partition between the slits (G in Fig. 2(a)), so the central spacing D of the double slit is the sum of the widths of a slit and the partition. Without loss of generality, the light waves passing through slits SL and SR are named PA and PB, respectively. According to the principle that light waves from different slits must interfere with each other, each light wave PA and PB interferes with each other. At a certain spatial location, each light wave in PA can encounter m light waves in PB (double dot in Fig. 2(a)); each light wave in PB can encounter n light waves in PA (double dot in Fig. 2(a)). The values m and n are natural numbers greater than 0. m and n are proportional to the distance from this position to the slit, the distance D and the light intensity and inversely proportional to the size of the photon, so the values are huge. The number of photons increases from $m+n$ to mn since each interference point creates a new photon that forms a stripe on the screen. Quanta greatly proliferate.

Note: (1) According to the principle of light wave interference, the following incredible conclusions can be drawn: the farther away Y is, the larger the interference space, the more interference points, the more photons from the interference points, and the brighter the stripe. This is patently absurd. Instead, as Y increases, the pattern is simultaneously amplified and dimmed. (2) The schematic diagram shown in Fig. 2(a) expresses limited information. It is only a horizontal section diagram, but the light source is not a two-dimensional arc only existing in this horizontal section. Normally, the light source is a sphere, so more interference will occur in three dimensions. That is, the interference along the length of the slit (Lm in Fig. 3(b)) should be greater than the experimental result (T in Fig. 3(a1)). The difference is that in practice, the width of the bright stripe in this direction (T in Fig. 3(a1)) is always the same as that of the light source (H in Fig. 2(c)). (3) The way light waves travel through the slit, one after the other, as shown in the figure, is not realistic. Although the width of the slit w (Fig. 2(c)) is narrow but much larger than the size of the photon, horizontal multiple photons (let us call the number p) walking side by side is the norm, which will increase the number of interferometric photons from $m+n+2p$ to mnp. (4) In the direction Lm (Fig. 3(b)), the light wave is a beam whose height is the same as the source height H (Fig. 2(c)) rather than just a layer on the cross section. Let the number of layers be q, which will increase the number of photons obtained from the interference from $m+n+2p+q$ to $mnpq$. In addition, the increase is proportional to the density of photons and inversely proportional to the size of a photon.

In conclusion, according to the principle of light wave interference, reasonable deduction indicates that proliferation of a large number of quanta will surely be produced. This obviously violates basic physical laws such as the conservation of matter and energy. In the test results, the propagating light wave is not presented due to principle error.

As shown in Fig. 2(a), the leading edge of the light wave always arrives on the screen before the foremost interference point. The mark printed on the screen is a record that the light wave has reached it. At this moment, there is some distance from the screen to the foremost interference point FI, which is proportional to the distance D. According to the principle of the double-slit interference test, the interference phenomenon is caused by the light wave with the leading edge missing. This means that quanta can be partitioned arbitrarily and that light waves with missing leading edges do not collapse to nothing. Here, a number of quantum principles are not followed.

Two light waves with phase difference π annihilate to form dark stripe. At this point, the peak of light wave A is aligned with the trough of light wave B (double dot in Fig. 2(a)); moreover, the trough of light wave A is aligned with the peak of light wave B (double dot in Fig. 2(a)). This is a pair of matter and antimatter that will annihilate each other. Since it is quantum, this would cause both light waves to disappear completely. This not only creates dark stripes but also makes them never glow again. Obviously, this is a line of death that no light wave can cross.

The principle of light wave interference is inconsistent with the results of the double-slit test

After careful comparison, the following is found:

See Fig. 2(a). Since the light wave from any slit cannot reach the center between the two targets, TL and TR, there should be a dark stripe. Compared with the test results shown in Fig. 3(a), this location does not exhibit a dark stripe but the brightest part of the pattern.

The mathematical model shown in Fig. 2(a) is a schematic diagram, and there is no other possible place for dark stripes to appear outside the center. Note that this is a schematic sketch. To show the details of the principle of interference, a large number of elements are omitted. The light waves in this image are so sparse that there are significant gaps between them, and they are so dim that they are barely visible. Fig. 3(a) shows that the light intensity of the light source is sufficiently bright. Because the space occupied by light is not exclusively occupied, the spaces occupied by photons can overlap partially or even completely. Not only is there no visible break between waves but also, the density of waves is high enough that each wave has to overlap with several waves to varying degrees. Therefore, dark stripes outside the center are not possible in the mathematical model. However, as shown in Fig. 3(a), several dark stripes regularly appear in the wrong places.

According to the principle, the interference area lies between the double-slit device and the screen. If the distance between them is changed (Y in Fig. 2(a)), then the pattern on the screen should change

accordingly, and different Y should correspond to different patterns. However, although the size of the pattern on the screen changes, the style does not. When Y is close enough, the pattern is concentrated in a small area and thus extremely bright. As Y increases, the pattern synchronously zooms and darkens. This is sufficient to prove that the pattern is shaped by double slits rather than interference and that the photons leaving the slits travel in straight lines, with no interactions between them. The so-called light wave and interference are not correct.

The superposition interference point has no size, whereas the photon generated by it does, which appears out of thin air.

As shown in Fig. 4(b), the divergence angle β of the stripe in the double-slit interference test is very small. According to the Conclusion of the Michelson-Morley test, this does not correspond to the characteristics of waves.

The result of water wave interference is a standing wave that is stationary and cannot propagate. Similarly, the light produced by superposition interference must be nonpropagating, static light that oscillates only at the permanent interference point and cannot move to the screen. The interference light reaching the screen must be superimposed on the screen. Stationary light can only be understood as nonemitting light or black light. Note that the interference points in the schematic diagram are all along the path from the double-slit device to the screen. According to the interference principle, they are permanent points that cannot move with the propagation of light waves, and the interference effect cannot reach the screen.

In conclusion, the result of the double-slit test cannot be caused by the interference of light waves. Both light waves and interference are wrong.

Paradoxical principles of interference

In the interference schematic diagram shown in Fig. 2(a), solid lines represent wave peaks, and dashed lines represent wave troughs. In the original Fig. 4(a), only peaks are drawn without troughs. Superposition interference occurs simultaneously at a pair of interpoints with the same characteristics, namely, solid line to solid line (peak- peak) and dashed line to dashed line (trough-trough). Destructive interference occurs simultaneously at the intersection of a pair of different features, namely, the solid-dashed line (peak-trough) and dashed line-solid line (trough-peak). In the principle of interference, the interference condition is often considered, whereas the principle of noninterference is ignored. However, a deeper study of the reasons for noninterference reveals a hidden side of the principle of interference. Because interference and noninterference are mutually exclusive, the noninterference condition as the excluded clause must be mutually exclusive with the interference condition to avoid the intersection of conditions. According to the principle of quantum indivisibility, a quantum or its basic physical properties can function only in a holistic way rather than partially, so only when all the

interference conditions work at the same time can the interference be triggered; that is, the interference process is also a quantum state. Otherwise, the principle of noninterference cannot be justified. As seen from the schematic diagram of interference, the duration of interference infinitely approaches 0 because the intersection point has no size. This means that (1) simultaneous rather than sequentially satisfied conditions trigger interference and (2) when the conditions are satisfied, interference occurs in a sudden rather than gradual manner. Although being much smaller than the wavelength makes it appear very different from the whole, this does not prevent each light wave from having all the features. The most basic physical characteristics of light waves are peaks and troughs. Therefore, interference rules must be followed: interference can be triggered only when the interference conditions of peaks and troughs of light waves are met at the same time. See Fig. 5(a). (A) is taken as the reference wave. Since the propagation directions are the same, the following can be easily understood: superposition interference of (B) with (A) occurs; (C) interferes with (A), resulting in mutual annihilation; and (D) does not interfere with (A). In summary, if the rays involved in the interference come from different directions, the interference can only gradually scan two light waves from a point, and the peaks and troughs cannot meet the interference conditions at the same time. Therefore, the double-slit test and the Michelson-Morley test do not follow the quantum principle of the interference process, and the experimental results obtained are not caused by light wave interference.

The medium of water wave propagation is fluid without a quantum state. The energy of a water wave is evenly distributed at the wave front. If there is no obstacle, then the wave propagates smoothly in the medium. When a water wave encounters a sufficiently hard obstacle, its normal propagation path is blocked. To satisfy the law of conservation of energy, the obstacle reflects a wavelet with the same frequency, wavelength and velocity as the wave source but with a phase difference of π. The water waves leaking out of a gap form a new wavelet source, as shown in the figure. The water waves from different gaps gradually interfere at the intersection points. Similarly, Thomas Young's principle of light wave interference is shown in Fig. 4(a). Only the waves generated from the same wave source can satisfy the interference conditions. A beam of light from slit “S1” of single-slit device DS reaches slits “S2” and “S3” of double-slit device DD at the same time and becomes two coherent beams, which interfere with each other to produce stripes in the double-slit test result. However, because the physical properties of “light waves” and water waves are considerably different, this plausible principle is not true. (1) The light source comes from the radiation of an electron transition and cannot be generated in a slit that may be in vacuum. (2) Quanta from different directions cannot interfere. (3) In Fig. 4(a), when DD rotates from Z0 to Z1 (relative to Z0, -π/8 to π/8), the experimental result is almost unchanged; that is, the light wave does not need to reach slits “S2” and “S3” at the same time. The stripe is not the result of light wave interference, and the experimental results do not agree with the principle of interference.

According to the original version of the progressive interference principle (see Fig. 5(c)), the directions of two interfering light waves must change after they interfere with each other, and the new directions are the angular bisectors of their included angles.

Unfortunately, interference is impossible even when all the conditions for light waves are met. The “light waves” traveling in the same direction must travel the same path, and because the speed of light is the same, the latter waves can never catch up with the former waves and therefore cannot interfere. Therefore, there is no possibility of interference. When multiple “light waves” meet, as expressed in formula (1), only their energy is combined without any other phenomenon occurring. Without the dubious double-slit test and the Michelson-Morley test, there is no evidence that intersecting rays interfere.

Disaster of light and matter wave theory: concomitant antimatter and matter

See Figure 1(a) and formulas (2) and (3). Since $u1(t)+u2(t)=0$, $u1(t)$ and $u2(t)$ are a pair of opposite waves that annihilate each other. Fig. 1(b) shows a circuit that generates signals of opposite polarity. In Fig. 1(a), the role of waves fluctuates over time once per period between positive and negative waves. The half-period region, X, is both a negative half-period of the positive wave and a positive half-period of the negative wave. For any initial phase $\theta 0$, the phases of $u1(t)$ and $u2(t)$ are always opposite. Thus, a point on a wave at any time can be positive at one reference point and negative at another. Obviously, the term wave applies to electromagnetic waves, light waves and matter waves. Because electromagnetic waves are manmade, how positive and negative waves cancel each other out, the equivalent of short-circuiting a synthetic signal to ground, is easily understood. However, the key feature of matter and light is objective matter, and negative light waves and negative matter waves are antimatter. If this is so, then the following surprising conclusions must be drawn: (1) Matter and antimatter periodically swap roles, matter and antimatter are conjoined, and matter is antimatter at the same time. (2) Light and negative waves periodically switch roles. Light and negative waves are joined, and light is also negative light. When light is identified as a wave, this strange feature unexpectedly arises.

Rotation test of a double-slit device, “interference of light waves to generate a stripe”, is not credible

For a fixed light source, as shown in Fig. 3, with the rotation of the double-slit device, the alignment direction La of the stripes generated in the test synchronously rotates, and the vertical relationship between La and the middle line of the double-slit Lm is always maintained. This shows that the key factor determining the direction of stripe arrangement is the angle of the device. Because interference occurs only after the slit, the orientation of the stripe is determined only by the orientation of the slit through which the light passes, and the interference effect of light is ignored, indicating that the experimental results are independent of the interference of light waves.

Fatal flaw: Ignoring the role of polarization direction in interference conditions

In Fig. 5(b), α is the polarization direction of the photon, which is the included angle between the photon vibration direction and horizontal direction. A light wave is a shear wave whose vibration direction lies in the normal plane S of its propagation direction. Water waves vibrate only vertically toward the center of the Earth. The difference is that the polarization direction of light is not just one direction but ranges all over plane S. In general, light has no particular preferred direction, and the polarization angle α of a photon is the average probability distribution, which ranges from 0 to π. For example, a solar beam contains all polarization directions, so it has no preferred polarization direction. Because of polarization, light waves must meet far harsher interference conditions than water waves. See Fig. 5(a). With (A) as the reference wave, if the polarization direction is different, the interference process cannot satisfy the quantum state. (E) cannot overlap with (A) as (B) does; (F) does not interfere with (A) annihilation as (C) does.

For two light waves to interfere, they must not only have the same frequency and constant phase difference but also be polarized in the same direction. See Fig. 5(c). In the figure, θ is the angle between the two light waves involved in the interference synthesis, and A is the amplitude of each light wave before the synthesis. After synthesis, the direction is the angle bisector of the included angle θ, and the amplitude is:

$$2A\cos(\theta/2)<2A$$

Since the polarization direction is not quantized, the vector composition of the new polarization direction is reasonable. However, since the amplitudes are quantized, the resultant vector amplitudes are unreasonable.

As a result, interference between light waves with different polarization directions is impossible. For example, to watch a stereoscopic movie, two visual signals with horizontal and vertical polarization directions are projected on the screen at the same time, but the two signals do not interfere with each other, and the polarizing glasses can correctly separate the two clear light signals. If the effect of the polarization direction is negligible, then the principle of noninterference cannot be explained.

The original double-slit test cannot be reproduced, and the only light waves pass through the target slit

The original version of the test used a double-slit test device (Fig. 4(a)), with a single-slit device in front of it for interference between two light beams. Obviously, (1) a sufficiently narrow slit “S1” must produce Fraunhoffer diffraction [18][19][20]; (2) when slit “S1” is wide enough, the common sense that rays cannot be bent prevents the light rays from the flickering candles from interfering with each other. An unavoidable problem is that when causality tests are carried out, light can collapse into particles in only the slit of the double slits; otherwise, if the light is already particles before entering slits “S2” and “S3”, then particles must hit the partition between the double slits such that few particles can pass through the slits.

The widely cited pattern of the original test results is shown in Fig. 4(a). However, the modern version of this test uses only a double-slit device, and the results are shown in Fig. 3(a). As is easily discovered, the two kinds of designs differ greatly: the stripe of the former is closer to a rectangle, whereas the stripe of the latter is closer to an ellipse.

Whether aimed or not, if light is a wave, then according to the mathematical models in Fig. 2(a) and Fig. 4(a), light waves must pass through the slit. However, the experimental results show that the intensity of incident light is much greater than that of the stripe after transmission. At the same time, much more light is reflected by the double-slit device than is transmitted. Only a small amount of light in the experiment manages to pass through the target slits. The vast majority of light that is not aimed at any slit cannot pass through the double-slit device and is reflected or absorbed.

Why does reflected light not interfere?

As shown in Fig. 2(b), reflected light waves can also cause interference. Objects can be seen because they reflect light. Screens are visible but not very reflective. However, from the test results, the device of any degree of reflection does not produce the interference effect of reflected light.

The lithography machine will not work properly if the light waves passing through the slit interfere with each other.

The slits of both the double-slit device and a lithography mask have similar optical properties. According to the conclusion of the double-slit interference test, the light waves interfere with each other to produce stripes; thus, the mask will inevitably produce countless interference stripes due to the numerous slits, and the lithography machine will not be able to clearly reproduce the patterns of the mask on the wafer.

Principle of refraction and propagation distance of light

As shown in Fig. 6, medium A is above an interface, in which the speed of light is V_A and the wavelength is λ_A. Below the interface is medium B, in which the speed of light is V_B and the wavelength is λ_B. According to Huygens' principle, what causes refraction when light passes through the interfaces of different media is that the refractive index of light is the ratio of the wavelengths in the different media. However, this principle is debatable, and the key factor that causes refraction is that the speed of light in different media results in different wavelengths of light.

The energy of an electromagnetic wave is determined by its amplitude, independent of frequency or wavelength, and its amplitude can be adjusted or limited. The amplitude of an electromagnetic wave can

be partially suppressed, which creates an extra spectrum. According to quantum theory [1][2][3], quantum energy is determined by frequency, is indivisible, and can only be absorbed or maintained as a whole. Therefore, the frequency of a quantum cannot be changed during its existence; otherwise, it becomes a different kind of quantum. As the distance a photon travels through a medium increases, the photon is destroyed as a whole once the speed of light cannot be maintained above the minimum threshold. If a sufficiently long distance is traveled, then all photons will be destroyed. Therefore, the denser the medium is, the slower the speed of light, and the shorter the distance light travels.

Modulation effect not shown by fiber-optic communication technology, light waves?

In optical fiber communications [15][16][17], the transmitted digital signal has a spectrum baseband whose bandwidth is proportional to the communication rate. Theoretically, the spectrum bandwidth of a digital signal is infinite. If light is a wave, then it is a carrier. Without loss of generality, let the carrier be $sin(\omega_c t)$ and the digital signal be $cos(\omega_s t)$. Then, ω_c is a single-frequency constant, and ω_s is not a single-frequency constant but a range. The modulation result is:

$$s(t) = sin(\omega_c t)\, cos(\omega_s t) = [sin(\omega_c+\omega_s)t+sin(\omega_c-\omega_s)t]/2 \qquad (4)$$

The resulting spectrum is a conjugate spectrum of $\omega_c + \omega_s$ and ω_c-ω_s centered on carrier frequency ω_c. This means that the frequency of the photon is changed from one to two conjugated spectra of the same width as the signal baseband. Because photons of different frequencies are different kinds of photons and the amplitude of the spectrum has no quantum characteristics, modulation turns one kind of photon into a series of photons of different frequencies, and the new photons are not quanta. This obviously violates the fundamental principles of quantum mechanics and does not occur in fiber-optic communications. Moreover, the spectrum in the baseband is continuous, but the spectrum of light is discontinuous, meaning that not every photon of the spectrum exists.

Light waves are inconsistent with the widely accepted Fourier principle

As shown in formula (1), the quantum energy E is determined by the number of quanta N, Planck constant h and frequency f. The frequency of each kind of quantum (such as a laser) is a constant, and each frequency constant corresponds to only one kind of quantum. Because they are unique, both quantum and laser spectra have only one line and no bandwidth. However, although frequency is a basic physical parameter of a wave, according to the Fourier transform principle [12][13][14], the signal must undergo a transition process involving harmonics before reaching the steady state at the starting and ending points; thus, any wave that exists only in finite space-time cannot have only one frequency but must have a frequency band. This conclusion was confirmed by radio communication technology [10][11] and is regarded as a basic principle that has to be followed. Otherwise, if there are electromagnetic

waves with zero bandwidth, then the brilliant achievements of radio communication technology would not be worth mentioning.

The reflection and focusing of light waves cannot be explained

Regardless of what it hits, a wave always creates a reflected wavelet source at the point of contact and propagates or spreads it outward. In this case, the reflection principle that the angle of reflection is equal to the angle of incidence does not apply. Thus, light waves cannot form specular reflections. Even when they hit a focusing element, the reflected light waves still spread out, which does not explain the focusing principle.

A photon is equivalent to sampling of a light wave, the physical basis of which collapses

As shown in Fig. 7, since the diameter of a photon is much smaller than its wavelength and a photon occupies space without exclusivity, the light intensity (i.e., density) is not restricted by space, so the number of photons that can be arranged within a single wavelength is very large. The reason why light waves are not drawn as solid lines is because the time occupied by photons in the whole period is negligible. Photons are just elements that make up light waves. In the figure below, the physical significance of a photon is equivalent to a single sampling of a light wave. According to the Nyquist sampling principle, the sampling spectrum symmetrically expands and is conjugated with the fundamental frequency of the photon. Only smooth waveforms have the narrowest spectrum, so the photons that make up a cycle of light must be a collection of photons with the same fundamental frequency but each with a different phase (which already undermines the interference condition). If the minimum phase difference between the photons is a constant, δ, then the phases of the photons in the collection are $k\delta$, where k is an integer, with k>=0. k is arranged in order from small to large, and the phase difference between adjacent photons is δ. As a photon moves, its phase does not change with time or position. Because each photon is different during the period, the structure of light waves is obviously absurd.

The Michelson-Morley test cannot eliminate the suspicion of machining traces and pinhole diffraction

The results of the Michelson-Morley test [21] yield three very important conclusions. (1) Light is a wave. (2) The speed of light is the same in all directions. (3)The aether does not exist. Light is not a wave according to the abundant evidence listed above. As this is contrary to the conclusion of the Michelson-Morley experiment, the following aspects of this experiment must be further studied. (1) First, one of the two optical paths should be removed, and the single optical path test without interference should be performed. (2) The imaging equipment is highly suspect. Due to the processing capacity limitations, arcs

must be replaced by broken lines, making processing ideal optical surfaces impossible. Mechanical traces on objects such as glasses or the bottom of glass bottles can produce optical patterns similar to those found in the tests. (3) If there is a pinhole, then the diffraction effect can also produce a similar pattern. (4) The opaque intermediate process should be studied openly.

Two startling conclusions are inescapable

Doppler's principle states that a wave is compressed as it moves toward an observer, a phenomenon known as forward motion. In contrast, the wave is stretched as the source moves away from the observer, a phenomenon known as backward motion. Thus, in a binary star system orbiting each other, if the stars are exactly at opposite ends of their orbits relative to the Earth, they fly as fast as possible, one toward the earth and the other away from the earth. If light is a wave, then according to Doppler's principle, the fading star must exhibit a redshift, whereas the advancing star must exhibit a blueshift. However, observations have shown that the stars in a binary system do not change color. Much evidence has been provided to prove that light is not a wave. The colors of the stars in a binary system remain the same because the conditions necessary to produce the Doppler effect are not present. However, the light in this phenomenon is still interpreted as a wave, which leads to two startling conclusions:

There is no redshift or blueshift because the speed of light is constant and independent of the reference frame. This conclusion is the cornerstone of relativity. Obviously this conclusion is not rigorous. The morning and evening sun is near the horizon, and the Earth rotates at a speed of approximately 465.18 m/s toward or away from the sun, respectively. This conclusion can be verified by measuring the light speed of sunlight accurately at these two special times. Note that the Earth's motion around the sun cannot be ignored.

The global positioning system (GPS) error data are completely different from the results calculated according to relativity. The higher the orbit is, the closer to the circle, and the closer the acceleration is to a constant value. The lower the elliptical orbit is, the flatter it is, and the greater the change in acceleration. The source of the oscillation of the cesium atomic clock [24] is a quartz crystal oscillator synchronized by the transition frequency of cesium atoms. Whether it is a transition or an oscillation, the frequency is inevitably affected by the acceleration and its variation, which generates major errors. The role of other factors (e.g., temperature, atmospheric pressure, etc.) cannot be ignored. However, the role of relativity is unclear.

According to Hubble's law [6][7], the farther from the Earth a celestial body is, the more serious the redshift. This completely ignores the fact that the colors of stars in binary systems do not change. The reality is that (1) because light is not a wave, the spectra of celestial bodies cannot be redshifted or blueshifted. (2) More distant objects become redder not because of redshift but because of blue decay. The sky is blue because light with shorter wavelengths is more easily deflected by the atmosphere. The sun becomes redder the closer it is to the horizon because that is when the light travels through the

thickest atmosphere. The Earth's atmosphere also has two special optical properties: the spectrum is modified by the spherical surface and the density gradient distribution of the atmosphere. If shorter wavelengths of light are consumed by refraction and absorption, only longer wavelengths of red light remain. Because there is no absolute vacuum, the farther light travels, the more gas accumulates along its path and the greater the spectrum is disturbed. The shorter the wavelength is, the more light is attenuated and refracted. (3) The subject of the so-called redshift is not the radiation spectrum of light but the absorption spectrum of hydrogen. Obviously, radiation is produced by a source, whereas absorption is produced by an object. The idea that a radiation wave source produces the Doppler effect is reasonable, but the principle that an absorbing material produces a redshift due to the Doppler effect is not reasonable. If the radiation has already been redshifted by the Doppler effect after it leaves the celestial body, are the absorption spectrum redshift data valid? The answer is no. This is because the radiation spectrum has been redshifted to a different spectrum with different absorption properties. (4) There are too few redshift characteristic data, and following the redshift results of an absorption spectrum determined by only a few typical characteristic data is difficult. (5) The comparison between typical characteristic data of an absorption spectrum and the standard value shows that the proportional relation is not precise. (6) Magnetic induction lines are closed loops that connect the radiating end to the receiving end and cannot be found in the same physical form in light. Regardless of how much they are redshifted, light waves cannot become magnetic lines. (7) The Lorentz transform [22][23] is based on the invariable speed of light, and redshift data cannot accurately match the standard regardless of whether this principle is used. (8) The conclusions derived from Hubble's law include the expansion of the universe, the Big Bang, dark matter and dark energy. However, concepts such as dark matter conflict with Kepler's planetary laws [8][9]. In fact, Kepler's three laws of planetary motion apply to all celestial bodies in the solar system. Its correctness is unquestionable, and its position cannot be shaken. Uranus and Neptune were found using these three laws in the absence of dark matter and dark energy. If dark matter and dark energy are considered, then the laws of our solar system will be overturned.

The phenomenon of "observation determines outcome" has also been observed

In the causality test of double-slit interference, (1) the test results before the introduction of observation are multiple stripes of light and dark, as shown in Fig. 8(a). Stripes are believed to result from interfering light waves. (2) If observation is introduced, then there are only two bright stripes with a dark stripe in the middle, as shown in Fig. 8(b). In this case, light is identified as a particle, and there is no interference of light waves. The cause of the two different test results was identified as whether they were observed. This leads to the confusing logic that the result of an experiment is ultimately determined by observation, i.e., whether observation is introduced. Whether an instrument or a person performs the observation and whether "observation changes the result of the test", the results of the test are ultimately known through human observation. Even if the cause of observation is the instrument, ultimately, the person observing the instrument is a human. If observation can falsify results, then it cannot be ruled out that a phenomenon is falsified when it is observed. If being observed makes a difference, then why must the

collapse rules be followed, i.e., when not observed, light collapses only into waves, and when observed, light collapses only into particles, and why not the other way around? Can "interference" stripes be generated again if light that has collapsed into particles is projected onto another double-slit device as a light source?

3. Conclusion

The analysis shows that light is not a wave and that light waves are a misconception in any case. Therefore, the light waves identified by the double-slit interference test, Michelson-Morley test, Huygens principle and wave-particle duality of light [4][5] are incorrect. Newton's particle model of light is also wrong. However, a new quantum model must agree with the results of the double-slit test. Therefore, Thomas Young's double-slit experiment is still a great physical experiment.

4. Instructions

The physical significance of quantum parameters such as frequency, wavelength and period

Although not a wave, a quantum still has physical parameters such as wavelength, frequency and period. The quantum properties described by these parameters include the transition period and size fluctuation. The size of quanta may fluctuate periodically. Although the energy of a quantum is fixed, its energy density spatial distribution may fluctuate periodically.

Light

Just as current is a directional flow of charge, light is a flow of photons. In any case, light never exhibits the properties of waves. All the conclusions about light waves are a distortion of the relevant experimental results.

There is no collision or energy exchange between intersecting rays

Since photons have a rest mass of zero, they are transparent to each other, and any photon does not prevent other photons from using the space they already occupy. There is no limit to the degree of overlap between the spaces occupied by different quanta, and quantum theory also holds that multiple photons can occupy the same space at the same time. As a result, the intersecting photons are not affected when they collide; neither an exchange of energy nor a change in the direction occurs for any of the photons. This rule only applies to photons with zero rest mass on both sides; otherwise, when contact occurs, the object can change the direction of photon motion or make the photon disappear.

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Figures

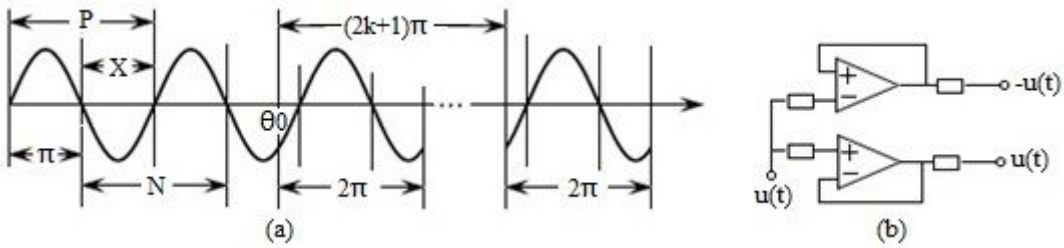

Figure 1

(a) Matter and antimatter waves are conjoined (b) Circuit for generating mutually inverted signals

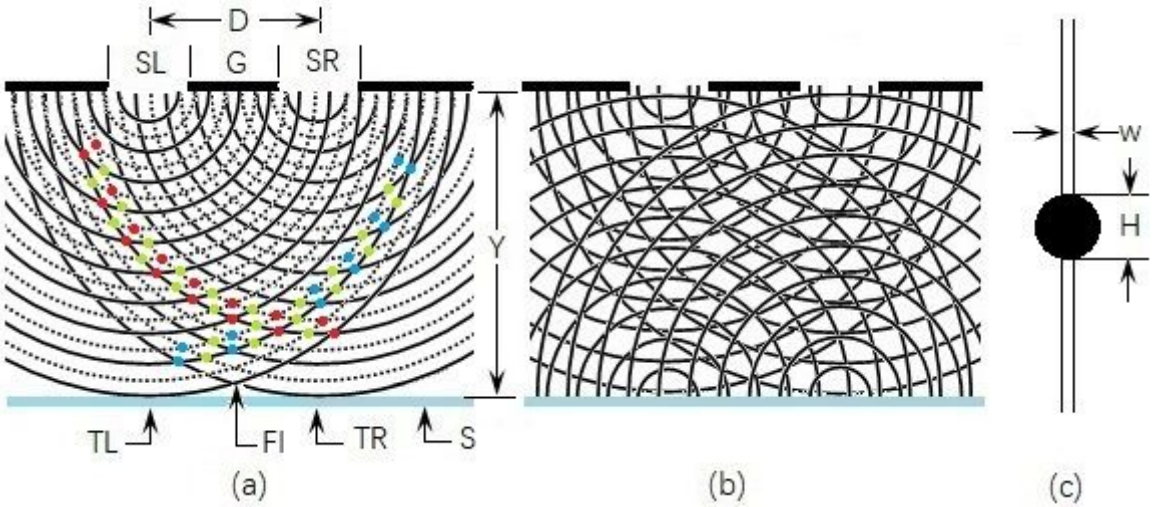

Figure 2

Mathematical model of the double-slit interference test

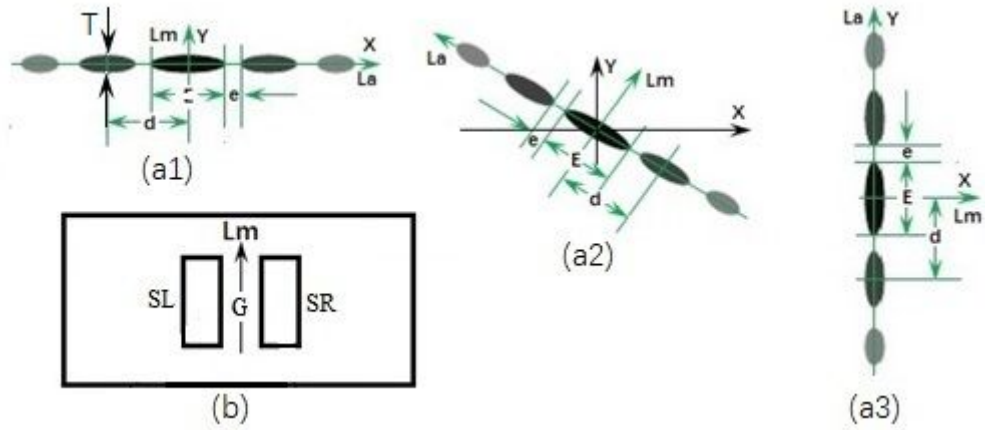

Figure 3

Double-slit test results and device

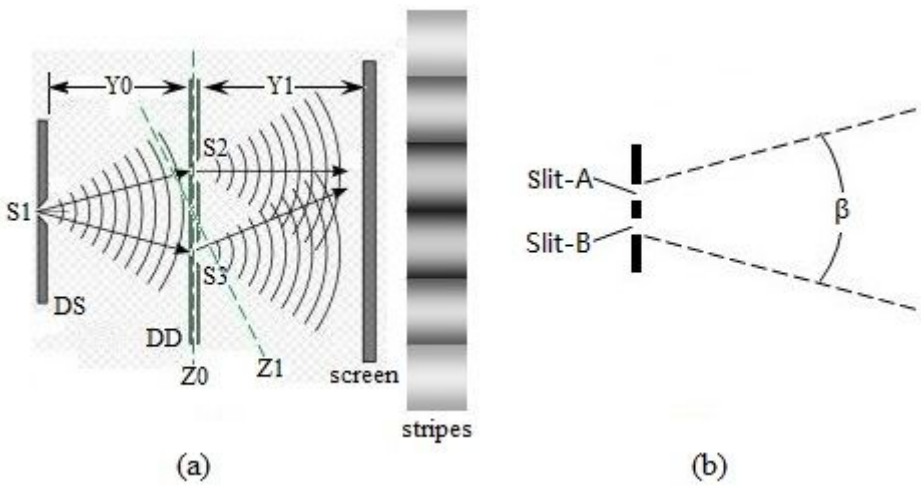

Figure 4

(a) The principle of original light wave interference (b) Scattering angle of stripes

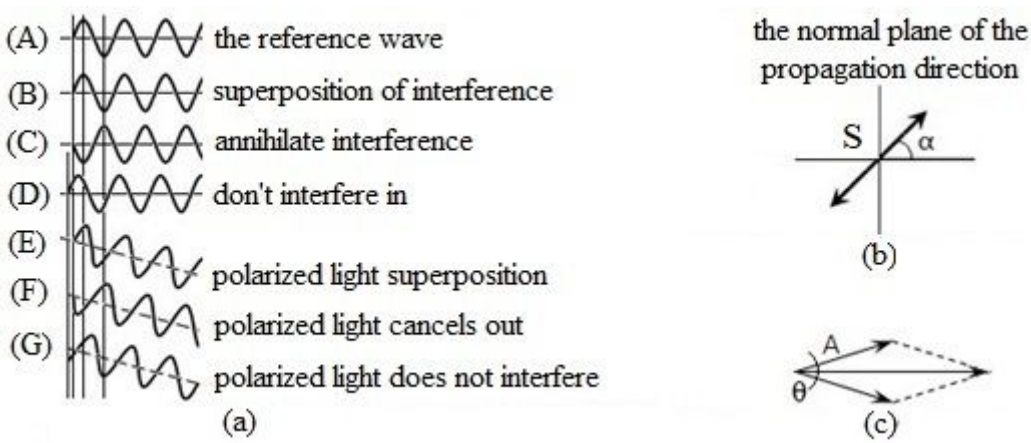

Figure 5

(a) Waveforms (including interference and polarization) (b) Diagram of the polarized light (c) Composition principle of vectors

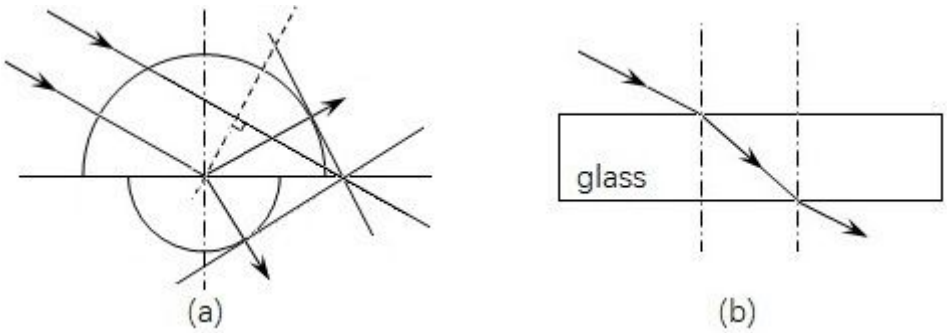

Figure 6

Huygens' principle and refraction of light

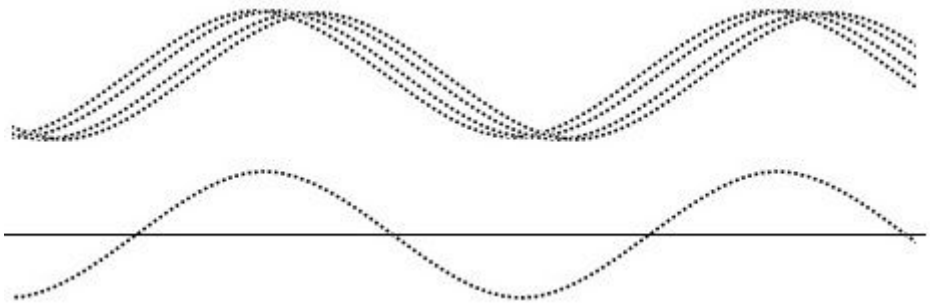

Figure 7

Light wave diagram

Figure 8

(a)Test results obtained before introduction of observation (b) Test results obtained by introducing observations