

The origin of wave particle duality

Wei Fan (凡伟)

Yunnan Qingtuo Culture Communication Co., Ltd. 650000 Kunming Yunnan China

Abstract:

what is the origin of wave-particle duality in quantum mechanics? This is an unsolved mystery in modern physics. In the latest research, I propose a possible explanation for the origin of wave particle duality. At the same time, I also proposed a feasible way to explain the origin of quantum and quantum entanglement.

Key words:

quantum mechanics; Wave-particle duality; Quantum entanglement; Cosmic redshift; Invariant principle of speed of light

Quote:

The question of the volatility and particle-like nature of light is one that has been going on since Newton's time. It was not until the establishment of quantum mechanics in the last century that we realized the wave-particle duality of light and other microscopic particles. Despite the great success of quantum mechanics, what is the origin of quantum? What is the origin of wave particle duality? Quantum mechanics is not yet well understood; At the same time, the probability wave and quantum entanglement are new puzzles. So we need a more complete theory. In the latest study, I found a kind of classical mechanics to explain the origin of wave-particle duality of quantum mechanics in a kind of feasible way, can eliminate the confusion of the probability wave, but also can explain the origin of the quantum and quantum entanglement. Through further derivation, I also stumbled upon another possible explanation for the invariance of the red shift and the speed of light in the universe.

1: the origin of wave-particle duality of light

According to quantum optics, photon emission, without the existence of the medium, electronic periodic orbit around outside the anti-nuclear movement are unable to transfer energy. So, we can put forward a kind of conjecture, i.e., the light can be a medium wave. Thus, the frequency of the light wave is equal to unit time the number of electron orbit around nuclear:

$$\nu = n = \frac{1}{T} \quad (1)$$

For an electronic through outward transfer the kinetic energy of the collision in the medium, can be defined as a constant, we here called the Planck's constant, because the electrons are doing around the nuclear periodic motion, so there is a time interval between cycle, then the radiation energy, it is not continuous, and can only be one separate energy, so the light energy are:

$$E = hn = h\nu \quad (2)$$

As can be seen from the above, the origin of the photons is electronic cycle operation of a frequency of light waves of energy, that is, the origin of the quantum is a single wave has kinetic energy.

The photoelectric effect of current on the energy of electrons absorbing photons is as follows:

$$h\nu = E_k + w \quad (3)$$

Can be seen from the above, the electron around the nucleus cycle movement will inevitably lead to the radiation and the energy absorption is one of continuous, so we can be explained from the Angle of the volatility of light particles of light, and then explains the light quantum and wave-particle duality of light and origins.

Discussion: in fact, not only is the energy of light waves not continuous, but the energy of any wave is not continuous. Because any waves is a periodic vibration, there any vibration cycle time interval, the interval lead to the existence of the peaks and troughs, the discontinuity of

the existence of the peaks and troughs caused energy, therefore, any wave of energy are continuous, we can go to the measurement of sound waves, sound waves have peaks and troughs, acoustic energy must also be continuous). In other words, the discontinuity of energy is an intrinsic property of waves, not unique to light waves. Thus, we can conclude that the judge: our quantum mechanics may be wrong from the beginning, we have been forced to study a wave of particles, resulting in light waves have wave-particle duality. It's like trying to force a man's femininity so that he doesn't look male or female.

Considering that the energy of electron radiation fluctuates at a macro level, it satisfies the Huygens - Fresnel principle:

$$dE = \frac{Kds}{L} \cos\left(\omega t - \frac{2\pi L}{\lambda}\right) \quad (4)$$

Vibration to:

$$E = \int dE = \int_s \frac{Kds}{L} \cos\left(\omega t - \frac{2\pi L}{\lambda}\right) \quad (5)$$

Considering the light waves can be spread in vacuum, liquid, gas, solid, suggesting that light was a medium instead of shear waves (later), micro mathematical expression can be represented as:

$$\tau_{ji,j} + \rho f_i = \rho \frac{\partial^2 u_i}{\partial t^2} \quad (6)$$

The longitudinal wave velocity is:

$$V = \sqrt{\frac{E}{\rho}} \quad (7)$$

Because we think of light waves here as longitudinal waves rather than horizontal waves, we can only use the mathematical expression of longitudinal waves.

The explanation is as follows:

For polarization phenomena of the shear properties of light waves, we can be interpreted as: as the light of the longitudinal wave through the solid medium (polaroid), caused by the secondary vibration (solid polaroid into new waves), because the polaroid as displacement of solid

medium is not going to happen, will happen only shear deformation, so the light waves from compressional to shear wave (such as sound waves travel through solid when converting from longitudinal shear wave), thus, light is the nature of the shear wave. So, we can use the p-wave explained Marius polarization is found (note: we think that light is a transverse wave, because Marius discovered the phenomenon of the polarization of the light, and Marius polarization phenomenon is found before, people all agree that light is longitudinal wave).

Discussion: the traditional theory that light waves are shear waves is actually a misunderstanding. Because shear waves require solid media, and the existence of solid media will cause stars to be unable to move, and astronomical observations show that all stars are moving, so light waves cannot be shear waves. Because light wave is the energy of electron vibration radiation, electron vibration belongs to mechanical motion, so light wave belongs to mechanical wave. (note: our textbooks have always believed that light waves are not mechanical waves and that light does not need a medium to travel. From the present perspective, our textbook view is wrong, so we need to modify the textbook.

At the same time, it can be seen from the above equation that the speed of light is inversely proportional to the density of the medium, which is expressed as:

$$V \propto \frac{1}{\rho} \quad (8)$$

According to Maxwell's electromagnetic theory, the wave velocity of electromagnetic waves is inversely proportional to the relative capacitance and relative magnetic

conductivity of the medium:

$$V \propto \frac{1}{\mathcal{E}, \mathcal{U}_r} \quad (9)$$

Considering that light wave is a kind of electromagnetic wave and light wave is a medium wave, electromagnetic wave is also a medium wave, so the relative capacitance of the medium is positively proportional to the relative magnetic conductivity and the density of the medium.

$$\mathcal{E}, \mathcal{U}_r \propto \rho \quad (10)$$

The wave velocity of electromagnetic waves is inversely proportional to the density of the medium:

$$V \propto \frac{1}{\mathcal{E}, \mathcal{U}_r} \propto \frac{1}{\rho} \quad (11)$$

Considering the medium p-wave alone, under the flat space-time, relative to the stars of the gravitational field distribution, so must light medium density distribution under the effect of gravity, which light is a kind of medium density wave. So, medium density is proportional to the gravitational field intensity distribution, then medium density is proportional to the potential gradient of gravity negative:

$$\rho \propto E = -\nabla \gamma P \quad (12)$$

Among them, is an undetermined constants. Can be seen from the type of light medium density and field intensity proportional relations, due to the speed of light and medium density is inversely proportional relationship, so the speed of light and gravitational field intensity is inversely proportional relationship is expressed as:

$$V \times E = k (k \neq 0) \quad (13)$$

Where, it's a constant. k Can be seen from the above, the strength of the gravitational field is strong, the slower the speed of light, presents gradient distribution in the speed of

light in the gravitational field at the same time. So we can by observing the same at different positions of field strength of the gravitational field of the speed of light and gravitational field intensity near the speed of light value to the size of the experiment.

Due to the strong gravitational field of the light medium density is relatively large, so, when a beam of light through the strong gravitational field, belongs to the hydrophobic medium to light dense medium transmission. Thus, when a beam of light passes through has strong gravitational field near objects, the light will inevitably occur obvious refraction phenomenon, of course the bending phenomenon have been confirmed by astronomical observations, and the deflection rate satisfies the refractive index's law:

$$n = \frac{c}{v} \quad (14)$$

Since the speed of light in the same speed is not a fixed value in gravitational field, but a change of gradient value, so the same gravitational field of the refractive index of light should be a change with strong gravitational field gradient range value, meet the relationship:

$$n \propto \rho \propto E = -\nabla \gamma P \quad (15)$$

With the actual astronomical observations of light deflection is a range of values, this can explain the general theory of relativity can explain the light bending, also more in line with the astronomical observations of light bending is a value range of the experimental results.

Considering the following relationship between wavelength and refractive index:

$$\lambda' = \frac{\lambda}{n} \quad (16)$$

Among them, said a vacuum wavelength, said the vacuum wavelength of medium, the refractive index. Thus we can see that when a beam of light through the strong gravitational field near, because of its refractive index change, whose wavelength would be smaller. When a beam of light emitted from the interior of the gravitational field, belongs to the dense medium to light thin medium propagation process, the refractive index decreases, then the wavelength will be larger, can produce red shift, this can explain the phenomenon of gravitational redshift.

Discussion and prediction:

1: relative to the stars by light transmission medium of the gravitational field distribution, then the gravitational field must be synchronized with the periodic movement of medium, we can through astronomical observations the existence of periodic motion of the medium disturbance wave, thus to prove whether light has the existence of the medium, to verify the rationality of the theory in this paper.

2: if there is medium, light and gravitational field relative to the stationary distribution. As we know, the earth on a certain object exploded, produces the high density of medium wave, the shock waves of light medium density is larger, we can make a beam of light through the shock wave, observing the speed of light is slow to prove the existence of light is a longitudinal wave is medium and light density medium.

2: origin of wave-particle duality of other matter particles

It can be seen from the above that light is a wave of medium particles, and the light intensity represents the energy flow density at a certain point. The mathematical

expression is:

$$I = \bar{S} = \bar{\Omega}u = 2\pi^2 \rho A^2 v^2 u \quad (17)$$

So, from microscopic to discuss the position and momentum of the light has no physical meaning, can only discuss the space distribution of each point of energy flow density conform to the classical principle of wave optics, so there is no probability distribution problem. Thus we can eliminate the confusion of light quantum probability distribution.

For electron beam through certain crystals with wave diffraction phenomenon. Because electronic is a periodic motion, said its wavelength is not electronic is a wave, said electronic cycle in the process of operation, a week before the movement of the electrons and a week after the movement of the electron orbital distance (or do translational motion of the spacing between the two group of electronic), satisfy the relationship:

$$\lambda = \frac{2\pi r}{n} \quad (18)$$

Where the frequency represents the number of times the electron moves around the nucleus per unit time (or the number of times the electron passes through a point in space per unit time).

$$v = n = \frac{2\pi r}{\lambda} \quad (19)$$

So, we think, electronic or other microscopic particles (such as neutron, atoms, etc.) through certain crystal wave diffraction phenomenon happens, said is not the wave is a kind of microscopic particle, but the elastic wave scattering through the crystal, and the scattering effect on macroscopic embodies a kind of volatility.

In terms of the mathematical description of the motion state of the scattering particle amount of a microscopic

material particle after elastic wave scattering, we can use the schrodinger equation to express:

$$i\hbar \frac{\partial \psi}{\partial t} = \hat{H} \psi \quad (20)$$

Reflect the microscopic particles after wave scattering scattering particle motions changing with the time. Does not change over time time-independent schrodinger equation, the physical wave equation is represented as:

$$\hat{H} \psi = E \psi \quad (21)$$

In the same way, the strength of a material wave (the square of its amplitude) represents not the probability density of a particular place, but the amount of scattered particles. N

$$N \propto |\psi(r, t)|^2 \quad (22)$$

Therefore, I explained the origin of wave particle duality in microscopic matter particles.

Discussion: through the above prove that, from the perspective of classical mechanics can we explain the various effects of quantum mechanics, quantum mechanics can explain can explain the phenomenon, can also explain quantum mechanics can not explain the phenomenon. So, I think I've come up with a new theory that can replace quantum mechanics.

3: the origin of quantum entanglement

Another fascinating aspect of quantum mechanics is the origin of quantum entanglement, an unsolved physics puzzle.

According to the above, the essence of quantum is the energy of a single wave. Because light is spherically symmetric potential $V(r)\psi$, so the light waves in office a little potential dv in across the globe there will always be in the opposite direction of a symmetric potential point dv' , we can turn any such a pair of symmetric potential points as a pair of entangled quantum. Therefore, quantum entanglement ψ is a symmetric state of two potential

points dv and dv' on a light wave. The mathematical expression is:

$$dv \ i \ dv' \quad (23)$$

When we measure the potential point on the light dv , will result in the light of spherically symmetric potential $V(r)\psi$ damage, leading to the ball of light waves in the symmetrical state of symmetrical potential disappear. (this is measuring led to the collapse of the wave ψ function), causing potential points dv' off their symmetrical state, causing potential point dv' movement, this is the effect of quantum entanglement, which we explained the origin of the quantum entanglement.

You can see from the above analysis, quantum entanglement is a wave on two symmetric potential point of potential state of a form, in fact there is no quantum entanglement, quantum entanglement any object which can be used to explain the phenomenon.

Discussion: quantum communication is a hot issue recently.

As can be seen from the above, transmitting quantum is to emit a single wave, which can be realized as quantum transmission. But quantum communication impossible, because the quantum entanglement is one of the two symmetric potential point of potential state of a kind of expression form, unable to communicate, so there is no quantum communication, quantum communication is a false concept; From the perspective of quantum cryptography communication, quantum key distribution is the use of light wave potential launch of the single batch ball symmetry principle of single wave, and by receiving the single-wave two symmetric point of potential energy as receiving the two code of quantum key distribution, so that, in turn, launched a series of single-wave series constituted a bunch of quantum code, if the communication can receive the single-wave code, other listeners can also receive the single-wave code to decipher, so there is no quantum cryptography. Normally, as by transmission single-wave code easy to interference, not for long distance transmission and widely used, through ordinary electromagnetic interference, the quantum transport of quantum key distribution can not be performed. Therefore,

neither quantum communication nor quantum secret communication exists.

4: another possible explanation for the cosmic red-shift

By the spread of light is medium, so light is the medium of kinetic energy and potential energy, i.e., the Hamiltonian, the spread of the light waves through a medium will need to be overcome in the process of medium Hamiltonian, we define this quantity for Hamiltonian damping coefficient, thus, because the energy loss in the process of transmission of light, so the frequency of the light wave will reduce, satisfy the mathematical relationship is as follows:

$$T = \frac{2\pi}{\omega} = \frac{2\pi}{(\omega_0^2 - \beta^2)^{\frac{1}{2}}} \quad (24)$$

Can be seen from the type, when light energy loss occurs in the process of transmission, the light frequency decreases, and spectrum redshift occurs, so that the red shift and damping coefficient of the Hamiltonian: proportional relationship, and because of the damping coefficient and the amount of dense, the light propagation proportional relation, thus, the red shift and proportional relationship:

$$\lambda \propto \beta \propto r \quad (25)$$

Therefore, it can be used to explain the red shift of the universe. If the red shift caused by the decrease of frequency per unit distance is expressed as a constant, then the relationship between the total red shift and the propagation distance is as follows:

$$d_\lambda = k \times r \quad (26)$$

As can be seen from the above, the further away the star is from us, the greater the energy loss of the star and the greater the red shift, which is ok

To provide another possible explanation for the spectral red-shift in the universe.

Discussion: according to the above analysis, the nature of light, as a kind of medium wave will cause energy loss in the communication process, because of work, and loss of energy will be converted to heat energy, so, we can predict that our space generally have a heat temperature, but it just can be used to explain the source of the value of the existence of the cosmic microwave background radiation temperature.

5: another possible explanation for the invariant principle of the speed of light

A misunderstood the speed of light, the same principle: according to Galileo relativity principle, the mechanics principle in any inertial system are equivalent. So, for the speed of light, the light of the gravitational field medium relative stationary distribution, we in any of the gravity field measurement of the speed of light is relative to the gravitational field static medium for inertial reference frame measuring the speed of a universal value, we can define this phenomenon as follows: relative speed invariance principle. Due to waves are transmitted to earth from the sun, from a galaxy is a switch to another department, and there is no distance between two department of gravity, so the light switch between two gravity system satisfy the equation:

$$\begin{cases} x' = x \\ y' = y \\ z' = z \\ t' = t \end{cases} \text{ or } \begin{cases} x = x' \\ y = y' \\ z = z' \\ t = t' \end{cases} \quad (27)$$

The principle of relative velocity invariance is obtained by solving the first derivative of the first three equations in the above formula with respect to time:

$$\begin{cases} v'_x = v_x \\ v'_y = v_y \\ v'_z = v_z \end{cases} \quad (28)$$

It can be predicted from the above expression that the sound velocity can also meet the principle of speed invariance by switching propagation in two inertial frame of reference. That is, we can do a plane and the velocity of the ground communication experiment, the people on the ground to measure the aircraft from the internal acoustic velocity is 340 m/s, is not a plane at a speed of 240 m/s and the sound velocity of 340 m/s after superposition of 580 m/s.

Reason: the sound waves in the process of spreading from inside the plane into the ground, there is a medium of inertial system switch, when the sound waves propagated to the aircraft skin, can cause the plane shell vibration, for the observer on the ground, the sound source is derived from the aircraft skin, and internal and not from the plane.

This principle can be used to explain the invariant principle of the speed of light, indicating that when light waves switch from one inertial system to another, there is a secondary emission.

Then, the principle of relative speed of light invariance can be expressed as:

$$\begin{cases} c'_x = c_x \\ c'_y = c_y \\ c'_z = c_z \end{cases} \quad (29)$$

Its vector form is:

$$c' = c \quad (30)$$

It can be seen from the above that the speed of light is constant and does not satisfy the superposition principle. The reason is that when light waves switch from one gravitational system to another, there is a secondary

emission of light waves. We usually measure the speed of light values that are light wave transmission medium for the reference value of the measured the speed of light, medium and light waves are always relative to the gravitational field, so, the speed of light in any speed measurement in the gravitational field values are the same. Thus, we say that the speed of light has nothing to do with the selection of reference frame, does not mean that the speed of light and the speed of light is the universe limit absolutely. Also is that we put forward another a feasibility interpretation about the speed of light, the same original way.

Discussion: can be seen from the above, the spread of light, medium is not absolute spatial distribution, but relative to the different gravitational field relative stationary distribution, spatial distribution of medium to and there is no absolute "ether" Michelson morley experiment.

6. summary

through the above proof, I explained the origin of wave particle duality and eliminated the confusion of probability wave in quantum mechanics. I also explained the origin of quantum and quantum entanglement. Because this paper can explain problems that can be explained by traditional theories and problems that cannot be explained by traditional theories, I propose a set of new theories that can replace quantum mechanics. Through further derivation, I also proposed another possible explanation for the invariant principle of the red shift and the speed of light in the universe. Of course, new theories always inevitably have some loopholes, and there are still many problems to be solved. So, if you find that there is something wrong with my theory, I hope you can tell me as soon as possible,

and I will modify it. In addition, if you stand in opposition to me, I also hope to gain your understanding (after all, the mainstream represents the present, and doubt represents the future). Second, my doctrine is not absolute truth, are completely can be replaced, hope later generations to overthrow me earlier theory, to seek a more close to the new theory of truth, promote the development of human civilization. I also welcome more friends who are interested in my research to participate in my research.

To my successor:

A: we have always believed that experiments are the only criterion for testing truth. A scientific theory is correct as long as it is tested experimentally, but it is actually a wrong idea. In fact experiment is necessary condition, not the only criterion of truth, the reason is that the experiment doesn't prove that any scientific theory is correct, the experiment can only make one looks more like the correct scientific theory. Because there are many kinds of theory can explain the same experimental phenomena, nobody can make sure that the experiment verification is only the theory put forward by you, rather than the other or use other theories can't explain. So, I hope you don't believe in authority, but be bold enough to question theories that have been tested by countless experiments. (including my theory)

B: any scientific theory is a phased interpretation of the cognitive level of the time of human development. With the progress of The Times and the deepening of human cognitive level, we can always put forward theories that are closer to truth according to the new cognitive level to replace traditional theories.

In this paper, my theory is only a stage explanation in the

process of human development, not the final truth. As human cognition progresses, you can also replace my theory with a new set of doctrines that are closer to truth through the level of certification in your time. Of course, this does not mean that your idea is absolutely right, your theory is also just in the process of human development stage, will also be replaced your new theories put forward by the later time. So, I'd like to welcome you to disprove my theory a little bit earlier, and to seek a new theory that is closer to the truth.

C: if you are lucky enough to present a scientific opinion that represents the "correct time" of the next era and cannot be published, stick to yourself and the truth.

Because that means you're trying to publish your heliocentric views in journals that support geocentrism; Evolutionary views are published in journals that support creationism through peer review by priests or popes. It is inevitable that the reviewer will reject your work because it is in flagrant violation of the scientific theory that has been verified by numerous experiments or does not meet the accepted scientific standards.

Because people always inevitable in their own time "right" as the standard to measure you proposed on behalf of the "correct" point of view of an era, due to the limitations of The Times, cognitive, and your time of peer review experts are traditional theory of vested interests, your point of view is inevitable can not be published.

Reference:

[1] since this paper is all about first-hand knowledge, there is no other reference for reference, so I hope to get more understanding.