Non-electromagnetic wave theory of light

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Summary:

Objective: To critique and reconstruct the theoretical foundation of "light as electromagnetic waves", proposing an alternative theoretical framework based on a real "ontology".

Method: Through logical analysis, it points out the conceptual confusion between "light has wave-like properties" and "light is an electromagnetic wave"; it reinterprets the LC oscillation circuit as a nuclear magnetic resonance process; it demonstrates that the wavelength measured by diffraction is the wavelength of the "momentum wave" rather than the wavelength of the electromagnetic transverse wave.

Conclusion: Light is a "light soliton" with rest mass and its wavyness is intrinsic "momentum wave". Vacuum electromagnetic properties (ε_0, μ_0) are the ontological properties of the "Qi-state crystalline ether". The geometric view of gravity in general relativity is a mathematical fiction based on false presuppositions. This work has provided a new ontological basis for unified understanding of the wave-particle duality.

Keywords: Photon; Matter Wave; Momentum Wave; LC Oscillation Circuit; Nuclear Magnetic Resonance; Ether; Qi State Crystal

I. Introduction: Einstein's Centennial Confusion and Theoretical Missteps

Although the debate between the wave and particle nature of light has temporarily concluded with the "wave-particle duality," Einstein's profound doubts in his later years, "Fifty years of deep reflection have never brought me close to the answer to this question: What is a photon? Everyone in this era thinks they know, but they are mistaken," 【1】 —reveal a deep crisis in existing theories. This paper believes that this crisis stems from a fundamental conceptual confusion: equating the attribute "light has wave-like properties" with the entity "light is an electromagnetic wave." This paper aims to demonstrate that the wave-like nature of light is its intrinsic "momentum wave" property as a massive particle, rather than an manifestation of classical electromagnetic transverse waves. As a result, the foundation of general relativity and the related interpretation of spacetime geometry, built upon the electromagnetic wave theory, will be shaken.

II. Core Argument: The Paradigm Shift from "Electromagnetic Waves" to "Momentum Waves"

2.1 The Conceptual Distinction Between "Volatility" and "Electromagnetic Waves"

Through a series of logical interrogations, the contradictions in existing theories can be revealed: If light is endowed with wave-like properties because it is an electromagnetic transverse wave, then why do all microscopic particles (such as electrons) also exhibit wave-like behavior? Using the wavelength λ measured by diffraction gratings, if it represents the wavelength of electromagnetic transverse waves, why can it be used to calculate the particle-like energy of photons $E = h\upsilon$ ($\upsilon = c/\lambda$)? This paper asserts that this λ actually represents the wavelength of the matter wave of photons as mass particles. We propose to formally name it the "momentum wave" wavelength to distinguish it from the illusory "electromagnetic wave" and abstract concepts like "probability wave" and "guiding wave", etc.

2.2 The Mass of Photons and Single-Photon Holography

"Science and Technology Daily" reported on July 21, 2017: According to Business Insider, scientists at Warsaw University in Poland have created the first hologram of a single photon using quantum interference **[2]**, which is impossible for electromagnetic waves. The message from the world's top academic journal "Science" on February 16, 2018: American scientists discovered a previously unseen

strange light in the laboratory: a new type of photon formed by combining two or three photons, characterized by large mass, slow speed, and mutual influence. This indicates that photons definitely have rest mass and cannot possibly be massless pure energy.

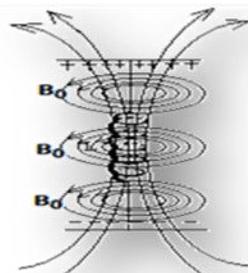**2.3 Reconstruction of the NMR Mechanism of the LC Oscillation Circuit**

Traditional theory attributes the radiation of LC circuits to the mutual excitation of electric and magnetic fields. This paper proposes a new mechanism: the circular current in the circuit generates a steady magnetic field B_0, and the electron group in the helical wire forms an equivalent "macroscopic nucleus". The oscillation of the circuit in the solenoid produces alternating energy that acts perpendicularly on the spin system of this "macroscopic nucleus". When the nuclear magnetic resonance condition is met, it induces collective spin level transitions, thereby radiating photons (i.e., the so-called "electromagnetic waves"). This model can more reasonably explain the quantized energy transfer process of circuit oscillations, and its frequency formula $f = 1/(2\pi\sqrt{LC})$ can be naturally derived from this mechanism. The following is a detailed analysis:

The actual process of the LC oscillator circuit generating electromagnetic waves (in fact, photons) is not propagated through electromagnetic mutual induction as originally analyzed by Maxwell! In fact, the real mechanism for the LC oscillator circuit to generate "electromagnetic waves" in the so-called "radio frequency band" is the principle of "nuclear magnetic resonance" that was widely familiar only after more than 100 years after Maxwell described electromagnetic waves!

In the traditional interpretation of how the so-called "electromagnetic waves" are generated in LC oscillating circuits, Maxwell's analysis has shown that a uniformly changing electric field in the capacitor will produce a steady magnetic field in the capacitor, just as a steady current passing through a straight wire does. In an open **LC** oscillating circuit, this steady circular magnetic field B0 (which overlaps with the helix, the rest is meaningless) is perpendicular to the alternating magnetic field in L. In this way, the "nuclear magnetic resonance" condition is fully met, so the "group electrons" in the helical wire (equivalent to a quasi-atomic nucleus - a macroscopic nucleus) will absorb the energy of the alternating magnetic field in **L**, produce transitions in the spin energy levels, and then release the energy in the form of so-called "electromagnetic waves" (photons, with wave-particle duality) when returning to the ground state.
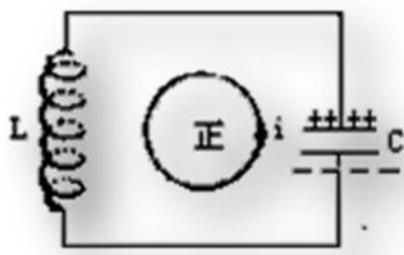
**LC oscillation circuit schematic diagram**   **LC oscillation circuit nuclear magnetic resonance diagram**

This is the true principle behind the generation of "electromagnetic waves (actually photons)" in LC oscillation circuits! It is also the reason why the effect of producing electromagnetic waves (photons) is greater when the capacitor is in an open state.

Moreover, when explaining how electromagnetic waves are generated, traditional theories clearly should describe a situation where electric fields and magnetic fields transform into each other, showing a rise and fall relationship (as shown in Figure 1), and tradition indeed describes it this way; but when ultimately expressing electromagnetic waves, the electric field and the magnetic field are actually in a

synchronous linear relationship, that is, they are in phase (as shown in Figure 2). In this case, it is impossible for them to exchange energy because they rise and fall simultaneously (synchronously)! Furthermore, if this were the case, energy would disappear at their intersection.
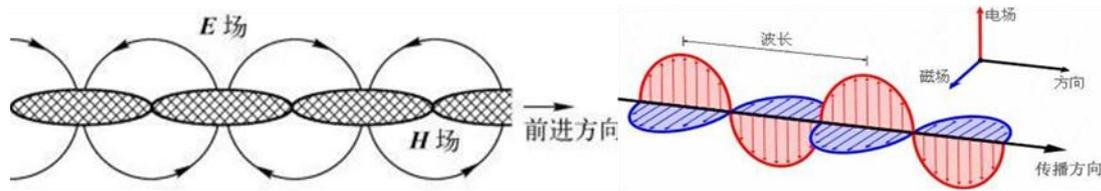
Electromagnetic mutual inductance fluctuation chart   Electromagnetic synchronous diagram

In fact, the oscillations of electrons can only produce infrared radiation at the thermal motion level and the plasma excitations Γ (quasi-particles, decaying into neutrino-antineutrino pairs) generated by the oscillations of group electrons, it is impossible to generate electromagnetic waves in the radio frequency band with very small energy! From the correlation between electromagnetic waves at the radio frequency level and nuclear spin energy level transitions (the invention of nuclear magnetic resonance instruments is based on this), we can know that the mystery of generating electromagnetic waves by **LC** oscillation circuits is not the oscillation of electrons (whether single electrons or group electrons), but the "spin" resonance produced by group electrons (on the spiral tube ring magnetic field plane)!

Therefore, its frequency can be directly derived, because the inductive reactance X_L and the capacitive reactance X_c in the same oscillatory circuit are necessarily the same (both are U/I, although U and I are changing, the values do not change), so:

$$(1/2\pi L f = X_L) = (X_C = 2\pi f C)$$

It follows that:

$$f = 1 \ /2\pi\sqrt{LC} \ \text{ or } \ \ T = 2\pi\sqrt{LC}$$

In fact, this conclusion just reverses to prove that X_L and X_c in the same oscillatory circuit are necessarily the same!

Therefore, photons, like all other massive particles, have a rest mass and wave-like properties (material waves). The wavelength of the material wave of photons, determined by diffraction, is independent of electromagnetic waves.

Upon knowing that light is indeed just special particles with rest mass, there's no need to interpret gravitational redshift and gravitational lensing through the bending of spacetime, and gravitational wave events are merely phenomena of the common "resultant force" changing!

Therefore, the "general relativity" based on the theory of electromagnetic waves is a fabricated error! As a result, there is no such thing as spacetime curvature, cosmological redshift, etc.!

III. Ontological Regression: The Reality of "Qi State Crystal Ether" and Wave Function

3.1 Ontological Interpretation of Vacuum Properties

The vacuum permittivity ε_0 and permeability μ_0 are not properties of space itself (since space, as a logical substrate, cannot possess any properties), but are electromagnetic properties of a real ontological entity — the "qi-state crystalline ether." This "ether" state is an absolute ideal gas, that is, an ideal, elastic "gaseous" ontological medium (with "Qi-state crystal" being more appropriate), whose capacitive and inductive characteristics per unit distance are manifested as ε_0 and μ_0. The speed of light constant $c = 1/\sqrt{\mu_0\varepsilon_0}$ is precisely the propagation speed of the "light solitons" excited in this medium.

Precisely because photons are solitons excited by the "ether", the same principle of nuclear magnetic resonance of the **LC** oscillation circuit can be used to determine their frequency. As we know from above, the frequency of the light quanta generated by the LC oscillation circuit is:

$$f = 1 / 2\pi\sqrt{LC}$$

In a vacuum, also known as "ether", there are only the capacitance characteristics ε_0 and inductance characteristics μ_0 within a unit distance, that is, L=μ_0.r, C=ε_0.r. Therefore, substituting these into the above formula yields:
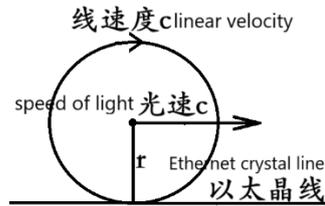
$$f = 1 / 2\pi\sqrt{(\varepsilon_0.r)\ (\mu_0.r)}$$

From this, we can get:

$$2\pi f.r = 1/\sqrt{\varepsilon_0\mu_0}$$

And $2\pi f = \omega$, where ω is the angular velocity, and $\omega.r = v$, where v is the linear velocity. Comparing with the conclusions of Maxwell's equations $c = 1/\sqrt{\mu_0\varepsilon_0}$, here $v = c$. That is:

$$2\pi f.r = c = 1/\sqrt{\varepsilon_0\mu_0}$$

So, this formula indicates that the speed of light is a linear velocity, and thereby, the true state of light is as follows:

In other words:

a. If this linear speed equals the speed of light, it suggests that the true state of photons is orbiting around a core (tentatively referred to as a micro black hole) at the speed of light, forming a photon ring. Viewing the ring and the black hole as a single entity, this would then be spin.

b. There is also a forward speed, indicating that this "photon ring" is rolling at the speed of light on the ether crystal, which makes it possible for the forward speed to also be the speed of light. This also proves that the **ether** itself is an absolute reference system.

c. As such, the angular momentum is conserved, $L = mc.r$, the angular momentum is quantized, also represented as $\hbar = mc.r$. From this, we can see that the so-called reduced Planck constant $\hbar$ is actually the angular momentum of photons! Restoring it gives:

$$\frac{h}{mc} = 2\pi r \ \text{or} \ \ h = p.2\pi r$$

The formula for photon matter waves verified by scientists:

$$\lambda = \frac{h}{mc}$$

Therefore, the wavelength of matter waves when photons are diffracted is $\lambda = 2\pi r$, and h is actually the impulse of a photon over a single period.

In this state, the photon ring unfolds directly from a circular (circumference $2\pi r$) to a linear wave state ($\lambda = 2\pi r$), essentially merging into the "ether" ground state, that is, transitioning from a "localized state" with rest mass back to an "unlocalized state" without mass. However, Momentum is conserved. so at this time the so-called "volatility" is not a matter wave, and it is even less likely to be an electromagnetic wave, but a "momentum wave."

Therefore, like other microscopic mass particles, they will also diffract due to the "momentum wave", and during the diffraction process, they will transition from a localized state to a delocalized state. This is because these microscopic particles are actually formed by the same "photon ring" (i.e., photons revolving around a micro black hole) that constitutes the mass of particles. The difference between them and photons lies in the different masses of the rotating photons, and the photon ring is no longer rolling on the ether surface, but has become an independent unit. That is to say, photons are solitary waves (standing waves) formed by water waves, while other mass particles are waves that have broken free from the water surface but still maintain their rotational momentum.

3.2 Unification of wave function and "ether"

So, what evidence proves that microscopic particles enter a delocalized "ether" state during the diffraction process?

Professor Long Guilu of Tsinghua University's "Delayed Choice Interference Experiment" confirmed the reality of the wave function [3]. This experiment is an improvement on the famous "Delayed Choice Experiment" by physicist Wheeler. In Long Guilu's experiment, it waits until the photon's wave function has already behaved like "two little greedy snakes", each taking one of the two paths through the interferometer and beginning to meet, before instantaneously deciding whether to insert a second beam splitter.

The results showed that whether the second beam splitter was inserted or not, the photons behaved as if they were always present in both paths at the same time. This challenges the spooky conclusion in the "delayed-choice experiment" that "the choice of the observer can affect the past." Professor Long Guilu vividly summarized its core idea in a sentence: "Whether you (the second beam splitter) are there or not, my wave function is here—in both paths at the same time." This implies that the existence of the wave function is objective and independent of subsequent measurement choices, thereby defending the causality in the microscopic world.

Therefore, Professor Long Guilu's work provides a more intuitive image for understanding wave functions: wave functions are the real form of microscopic objects themselves in space, not an abstract tool for probability calculation.

This paper believes that the real "wave function" is the wave state of the "Qi state crystalline ether". Photons are the quantized soliton excitations (quasi-particles) in this medium. The "smoke ring-shaped spatiotemporal optical vortices (STOVs)" [4]observed in lasers   and the "orbital angular momentum vortices (OAM)" [5] similar to water vortices are the intuitive manifestations of the collective behavior of "light solitons", rather than the superposition of abstract and non-existent electromagnetic transverse waves.

IV. Reinterpretation of General Relativity and Related Phenomena

Based on the concept that light has a static mass and is a "light soliton," the core verification of general relativity, such as the bending of light (so-called gravitational lensing), does not require the introduction of the geometric concept of "curvature of spacetime." The gravitational field can be understood as the density gradient field of the "qi-state crystalline ether," and phenomena like gravitational lensing are refractions of light propagating in this gradient field, unrelated to the curvature of space. Moreover, the idea of "space curving within space" contains a logical fallacy. As for the actual reasons for phenomena like the precession of Mercury, they are completely unrelated to this and have other explanations.

V. Conclusion

This paper systematically demonstrates the core thesis that "light is not an electromagnetic wave." The essence of light is based on the "qi-state crystalline ether" and possesses rest mass as a "light soliton,"

its wave-like nature is an intrinsic "momentum wave." This paradigm shift resolves Einstein's lifelong confusion, interprets the wave function as actual medium fluctuations, and paves a new, ontology-based path for unifying the understanding of quantum phenomena and gravitational phenomena.

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