Propagation Process of Electromagnetic Waves and the Representation of in Coordinate Forms(32)

- For a specific understanding of the magnetic field of electromagnetic waves. -

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Abstract

1. Electromagnetic waves can be classified into by two types from a morphological perspective. To state it another way, electromagnetic wave exists independently on the wave model and the particle model. Additionally, all electromagnetic waves of the wave model have the structure of radio waves, whereas all electromagnetic waves of the particle model have the structure of light waves. Hence, any electromagnetic wave cannot have functions within the wave model and the particle model simultaneously.

2. In the process of the propagating radio waves and light waves, the magnetic forces play a role in both. Also, the property of magnetic forces must have the directionality of an N pole and an S pole. However, in the propagation process of radio waves and light waves, the role of magnetic forces act on completely different conditions.

3. When the magnetic forces of radio waves and light waves are expressed in a coordinate format, the operating principles of radio waves and light waves can be conveniently understood. In other words, through the directionality of the N pole and the S pole, which the radio wave and the light wave have individually, the wave model and particle model of the electromagnetic waves can be clearly distinguished.

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Sequence

Ⅰ. Introduction

The quantum mechanics of modern physics require the consideration of wave and particle natures of electromagnetic waves (light wave) simultaneously. However, a technic, that combines the wave and particle natures into one system has not been presented to date.[17]
<http://batangs9.com/E-17.pdf>

In a strict perspective of physics, the particle model cannot accommodate the wave nature, and the structure of the wave model cannot accommodate the particle nature. In other words, the structures of the particle model and the wave model cannot be combined into one system. Therefore, the combination of the particle and the wave natures are fundamentally impossible.

As introduced in the study **"Misunderstandings of Maxwell's Equation on Electromagnetic Wave and Different Interpretation"**, electromagnetic waves can be classified into by two types from a morphological perspective. To state it another way, electromagnetic wave exists independently on the wave model and the particle model. Additionally, all electromagnetic waves of the wave model have the structure of radio waves, whereas all electromagnetic waves of the particle model have the structure of light waves. Hence, any electromagnetic wave cannot have functions within the wave model and the particle model simultaneously.[29]
<http://batangs9.com/E-29.pdf>

A radio wave can be defined as waves of the magnetic field. Also, all types of radio waves are produced in the periphery of moving electrons (current, wire of conductors) and connected to the frequency of the moving electrons. In the scope of radio waves, long waves, short waves, ultrashort waves, microwaves, etc. are included.

Light waves can be defined as a photon propagating at the speed of light. Also, all types of light waves are released as individual units (1, 2, 3, 4...) independently within the electron (elementary particle). The scope of light waves (photons) includes infrared rays, visible rays, ultraviolet rays, X-rays, etc.

The radio wave is composed of only the wave model, and the light wave (photo current) is composed only of the particle model. Also, the production process of the radio wave and the light wave is different. However, the radio waves of the wave model and the light waves of the particle model have the common characteristics of being an electromagnetic wave. Despite this, these two types of electromagnetic waves (radio wave, light wave) must be treated individually.

In the process of the propagating radio waves in the wave model and light waves in the particle model, the magnetic forces play a role in both. Also, the property of magnetic forces must have the directionality of an N pole and an S pole. However, in the propagation process of radio waves and light waves, the role of magnetic forces act on completely different conditions.

When the magnetic forces of radio waves and light waves are expressed in a coordinate format, the operating principles of radio waves and light waves can be conveniently understood. In other words, through the directionality of the N pole and the S pole, which the radio wave and the light wave have individually, the wave model and particle model of the electromagnetic waves can be clearly distinguished.[30], [31]
<http://batangs9.com/E-30.pdf>, <http://batangs9.com/E-31.pdf>

In the Main Body, I intend to introduce the differences between radio

waves and light waves focusing on their propagation using different operating principles. Also, I will explain the role of magnetic forces in respect tothe properties of light waves and radio waves, introduce the difference between light waves and radio waves, which reflect the directionality of S poles and N poles. Finally, I will introduce the differences between light waves and radio waves expressed in the coordinate form.

Ⅱ. Main Body

In rendering his model (the morphological structure and equation) of electromagnetic waves, Maxwell's presupposition was that the electric field and the magnetic field could be incorporated into a singular system. In other words, the relationship between the electric field and the magnetic field could be expressed by a vertical vector. Such an electromagnetic wave is depicted in Figure 1. In Figure 1, E on the Y-axis represents the electric field, B on the X-axis represents the magnetic field, and the vector on the Z-axis represents the direction in which the electromagnetic wave travels.

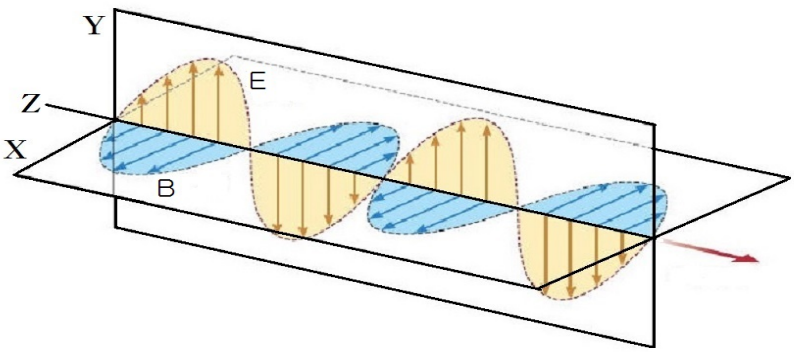

Figure 1. Diagram of the Electromagnetic Wave Constructed through the Regimentation of Electric Field and Magnetic Field.

The electric fields (electric forces) and magnetic fields (magnetic forces) are composed of different functions, and a result the operating principles of

electric fields and magnetic fields are also different. Also, the magnetic field and the electric field do not have a causal link (or structural continuity). Therefore, the electric field and the magnetic field cannot be integrated into a singular system (unit). In other words, Maxwell's electromagnetic wave equation, which presupposes the integration of the electric field and the magnetic field, is fundamentally flawed.[29]

<http://batangs9.com/E-29.pdf>

As Faraday's electromagnetic induction demonstrates empirically, a variable magnetic field creates induced electromotive forces, which can be expressed with a vertical vector. Also, the action of the induced electromotive force creates a variable magnetic field which can be expressed with a vertical vector. Specifically, the induced electromotive force acts as a "space current." Therefore, the equation <induced electromotive force = space current> can be established.[22]

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The space current (induced electromotive force) may be defined as the displacement (mobility) of spatial elements. Namely, space current refers to the wind (flow) of spatial elements. Furthermore, the space current and the ordinary current of the electrons in motion perform identical functions and are distinguished only by the difference in the amount of current.

A conductive wire cannot create or absorb the electromagnetic wave shown in Figure 1. Obviously, the electrons (elementary particles) cannot generate electromagnetic wave as shown in Figure 1, and the electrons cannot absorb the electromagnetic wave as shown in Figure 1. In a nutshell, the structure of the electromagnetic wave expressed in Figure 1 is only a fictitious, conceptual model and does not actually exist.

The major mistake made by Maxwell was to recognize the motion of

the electron and the motion of the magnetic field as equals. Also, the characteristics of the current and the electric field were confused, and it was misunderstood that the property of the current was introduced in the electric field. That is because the role of the current was excluded (omitted) in the process of developing the Electromagnetic Wave Equation, and the motion of the electric field was later applied as an alternative to the current. This distorted awareness by Maxwell has been passed on until today, inhibiting the development of physics.

The magnetic field (magnetic force) must have the direction of an N pole and an S pole. However, in the diagram in Figure 1 cannot reflect the directionality of the N pole and S poles. In other words, the diagram in Figure 1 is a distortion of the actual phenomenon (directionality of magnetic field). Therefore, **as the diagram of Figure 1 that does not reflect the directionality of the N pole and S poles, it should be discarded.**

The radio waves of the wave model and the light waves of the particle model share a common point, in which they are produced in concert with electrons. However, the role of electrons is completely different during the production process of light waves and radio waves. As an example, the radio waves of the wave model are produced in a connective structure near the moving electron (current, electric wire), and the light waves (photons) of the particle model are released independently as an individual unit inside the resting electron.

1. Representation in Coordinate Form of Light Waves.

When the electron moves (penetrate) through space, this moving electron has the function of the current, and the magnetic field, represented by a vertical vector, is produced peripherally to the current (moving electron).

The photon (light wave) has the function of the current. The photon of light serving the function of the current shall be referred to as the "photo current". Here, the "photo current" moving at light speed and the current of the moving electron are distinguished only by their difference in scale (volume).

The photo current of light produces a vertical vector known as "photo magnetic", and that vector produces the propulsion of the photo current. For that reason, the photo current and the photo magnetic are mutually dependent. Therefore, the photo current and the photo magnetic can be compared as equal values.

The high compressive force of the photo current and the right spin direction of the photo magneticoccur in the first half of the light wave. However, in the last half of the light wave, the relative vacuum of the photo current and the left spin direction of the photo magnetic occur. Also, the production (right spin) and extinction (left spin) of the photo magnetic is accomplished in a single regression (reversion).

The appearance (production and extinction) of the photo magnetic occurred as the photo current wave passed a point, moving at the speed of light. However, the photo magnetic instantly became extinct in its original position after the photo current passed. In other words, the photo magnetic does not follow the photo current sequentially and does not deviate from its original position. Thus, when the photo magnetic is produced instantly at the penetration point of the photo current, there can be a misunderstanding (mistake) thinking that (companion) photo magnetic is accompanying and the photo current.[30] <http://batangs9.com/E-30.pdf>

The mutual dependence between the photo current and photo magnetic

can easily be understood through the model depicted in Figure 2. In the diagram, E is the stationary electron, P is the photo current (photon) propagating at the velocity of light, the big arrow of ⇒ is the direction of the photo current (P), Mf is the photo magnetic occurring in the front part of photo current (P), Mr is the photo magnetic occurring in the latter part of photon current (P), and the small arrows of ↑ and ↓ show the directionality of the photo magnetics (Mr, Mf).

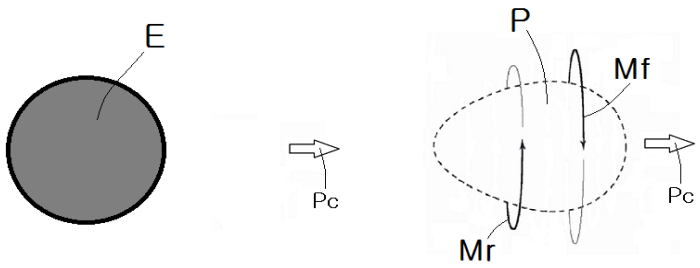

Figure 2. The process by which a stationary electron emits light waves in the particle model and the situation map on the process of propagation of light waves.

The relationship between the photo current and the photo magneticcan be conveniently understood through the representation of coordinates in Figure 3. In the representation of coordinates in Figure 3, X is the horizontal axis of the coordinates, Y is the vertical axis of the coordinates, O is the center point of the coordinate plane, E is the electron, P is the photo current emitted by the electron (E), and Mf represents the rightward direction of rotation of the photo current generated in the first half of the photo current (P), Mr represents the leftward direction of rotation of the photo current generated in the latter half of the photo current (P), ⊙ is the head of the arrow referring to the directionality (direction deviated outside the paper surface) of the photo magnetic (Mf, Mr), Ⓧ is the tail of the arrow specifying the directionality (direction of entering inside the paper surface) of the photo magnetic (Mf, Mr), and Pc represents the traveling direction of the photo current (P).

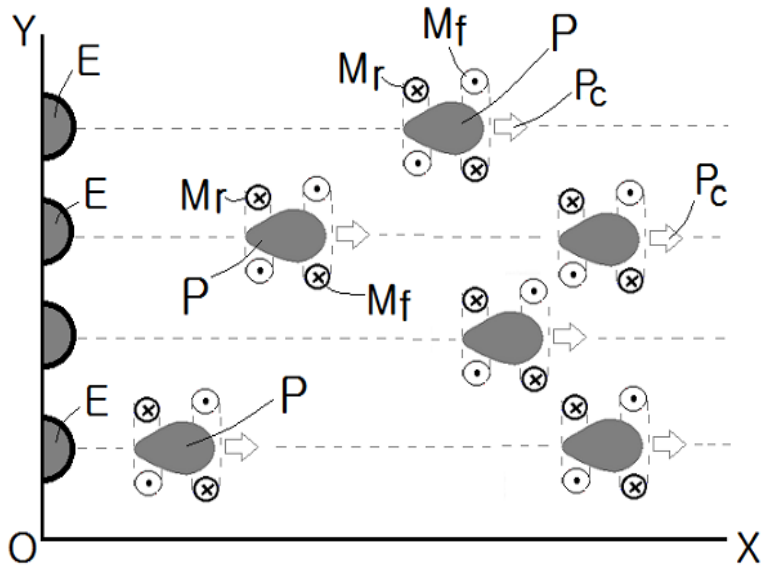

Figure 3. Cross-sectional diagram on the propagation process of light wave shown in the coordinate form.

A stationary electron can discharge or absorb the particulate light wave. Also, thermal energy (electric charge, electric force) is preserved inside the stationary electron that has absorbed the light wave. However, stationary electrons do not generate or absorb radio waves. Even if a stationary electron happens to absorb a radio wave, thermal energy is not generated inside the electron.

If electrons inside a microwave are affected by a radio wave (microwave), the thermal energy of the light wave is generated due to the violent motion of the affected electrons, and this thermal energy, due to the light wave, can be absorbed into electrons. To clarify, after the radio wave is converted to thermal energy (light wave), and that thermal energy has the ability to be absorbed by electrons.

The photo currenthas the representative nature of the particle model during the propagation process of light waves, and the photo magnetic acts as an auxiliary function. Also, the progress of the at light velocity (C)

is led by the electric current during the propagation of light waves. That is, the photo current of light waves is propagated and the photo magnetic is generated and undergoes extinction at its original location.[30]

<http://batangs9.com/E-30.pdf>

The initial light wave released by an electron consists of individual particle models. That is, light waves do not obey the frequency and wavelength wave concept. However, the photo magnetic commutatively acts in the propagation process of light waves. As a result, the back-and-forth spacing (wavelength) of the interference effect occurs subsequently. Therefore, the model of the light wave from Figure 1 should be completely discarded.

2. Representation in Coordinate Form of Radio Waves.

The radio wave is composed of the concentration of the "magnetic field wave" and the "space current". Therefore, a new equation must be implemented, <radio wave = space current + magnetic field wave>. Also, this magnetic field wave and the space current maintain the reliance (causal connectivity) of being able to be considered mutually. If the existence of the space current is denied, the occurrence and the spread of the radio wave cannot be interpreted rationally. In this situation, the concept of <radio wave = electric field + magnetic field> must be modified (discarded).[31]

<http://batangs9.com/E-31.pdf>

When an AC current passes through the electric wire of a conductor, the magnetic field wave of the curl vector on the left and the magnetic field wave of the curl vector on the right share a periodic linkage on the side of the electric wire. The periodic linkage structure of two magnetic field waves constitutes a radio wave. Also, the frequency of the magnetic field wave is determined by the frequency of the AC current passing through the electric wire.

This magnetic field wave can be defined as the periodic frequency of

the magnetic force having an S pole and an N pole. In other words, the magnetic wave of a radio wave is constituted by the periodic oscillation of the magnetic force having an S pole and an N pole. Also, in the outer space, which the magnetic field wave penetrates, a space current with a vertical vector occurs which induces an electromotive force.

The space current of the radio wave and the current in the electric wire are applied in the same direction at all times. In a nutshell, the space current (induced electromotive force)and the electric current in the electric wire register structural continuity through the magnetic field wave being represented as a vertical vector. The magnetic field wave and the space current of the radio wave permanently repeat their effective interchange, and the interchange between the magnetic field wave and the space current always takes place in a progressive form. In other words, the magnetic field wave and the space current maintain a reliance (causal connectivity) and are able to be converted mutually.

Through the propagation of the radio wave, the magnetic field wave represents the waveform model, while the space current takes on a supporting role. The magnetic field waves are propagated at the speed of light (C), the space current does not however blindly follow the magnetic field wave. In other words, only at the point in the outer space where the magnetic field wave penetrates, the space current occurs.

Once the magnetic field wave has passed,the space current goes through creation and annihilation. Therefore, the space current does not deviate from its original position. Also, the magnetic field wave and the space current have continuity of functions and are compared as equivalent values. In other words, the concentration of the radio wave is composed of the mutual conversion of the magnetic field wave and the space current.

This occurrence process of the magnetic field wave can be understood

conveniently through the cross-sectional diagram in Figure 4. In Figure 4, D in the center is the cross section of the electric wire vertically penetrating the paper surface or monitor screen, m_1 (red) is the magnetic field wave of the curl vector to the left, all m_2 (blue) is the magnetic field wave of the curl vector to the right, and the small arrows of ↺ and ↻ refer to the directionality of the magnetic force composing all magnetic field waves (m_1, m_2). Also, the ⊙ of Ea is the head of the arrow referring to the displacement direction (direction deviated outside the paper surface) of the space current, the ⓧ of Eb is the tail of the arrow specifying the displacement direction (direction of entering inside the paper surface) of the space current. The big arrows of m_L and m_R show the spreading direction of the magnetic field wave (m_1, m_2). The space current (Ea, Eb) of vertical vector occurred on the side of all magnetic field waves (m_1, m_2) and induced an electromotive force.

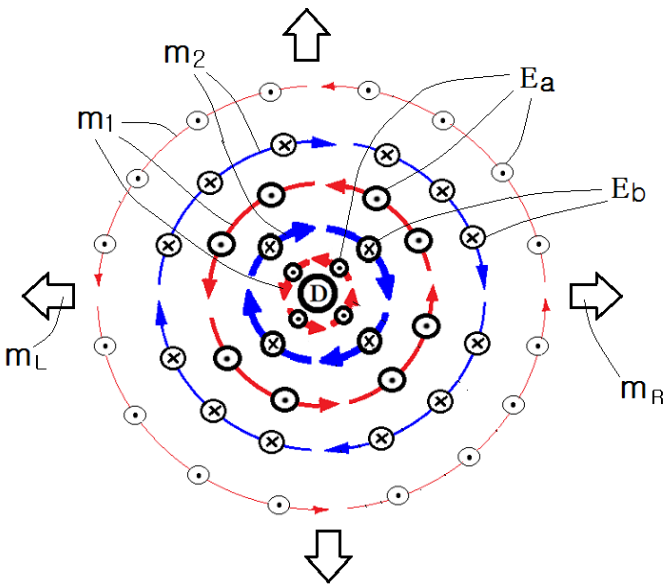

Figure 4. Cross-sectionaldiagram on the process of the AC-type magnetic field wave and the space current of vertical vector occurring on the side of the electric wire (D).

The magnetic field wave of the radio wave has the structure of a longitudinal wave, and its spread occurs at the speed of light (C). Also, the magnetic field wave has the magnetic force being concentrated in the

direction of the small arrows (∪, ∪). When the AC current passing through the electric wire (D) of the conductor is converted into the opposite direction, the directivity (∪, ∪) and the displacement direction (⊙, ⊗) of the space current (induced electromotive force) on all magnetic field waves (m_1, m_2) are converted.

As shown in Figure 4, the effect of the magnetic field wave (m_1, m_2) occurring in the periodic linkage structure on the side of the electric wire (D) can be understood more conveniently through expression in the coordinate form. The cross-sectional diagram in Figure 5 shows the spreading process of the magnetic field wave and the production process of the space current in the coordinate form.

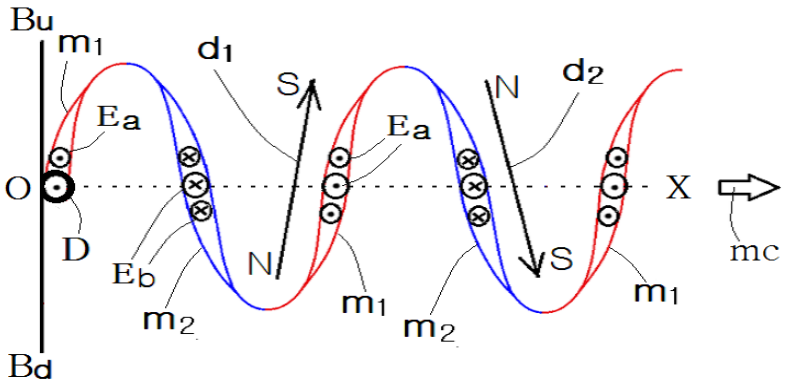

Figure 5. The spreading process of the magnetic field wave and the production process of the space current in coordinate form.

In Figure 5, O is the center point of the coordinate plane, D is the center of the electric wire (or AC current), Bu and Bd are the working distances of the magnetic field wave, X is the horizontal axis of the coordinate plane, d_1 is the upward function of magnetic force having an S pole and an N pole, d_2 is the downward function of magnetic force having an N pole and an S pole, m_1 (red) is the magnetic field wave composed of the magnetic force of d_1, and m_2 (blue) is the magnetic field wave

composed of the magnetic force of d_2. Also, the ⊙ in Ea is the head of the space current (displaced) outside the surface, the Ⓧ of Eb is the tail of the space current (displaced) outside the paper surface, and the arrow of m_R shows the directionality of the magnetic field wave (m_1, m_2).

The magnetic force (S pole and N pole) of the upward magnetic field wave and the downward magnetic field wave composing the radio wave are converted into opposite poles at the peak of the wave. In other words, the S pole and the N pole of the magnetic force are the peaks of the wave. Therefore, the horizontal axis (dotted line), X, is unnecessary in the coordinates to accurately express the structure of the magnetic field wave. This condition of the radio wave does not take into account the interference effect. Also, the photoelectric effect does occur in the process of spreading in the wave model.

The waveform radio wave is created by the motion (current) of electrons. A conductive wire can absorb the waveform radio wave. Thus, the displacement of the current (motion of electrons) and voltage occur inside the wire that has absorbed the radio wave. However, the conductive wire cannot generate a particulate light wave and cannot absorb a light wave. Even if a conductive wire should happen to absorb a light wave, the displacement current and voltage are not generated inside the wire as a result of it.[31] <http://batangs9.com/E-31.pdf>

If the existence of the space current (induced electromotive force) is denied, the occurrence and spread of the radio wave cannot be interpreted rationally. That is, the concept of <radio waves = electric field wave + magnetic field wave> is not established. In this perspective of logic, the model of the radio wave with regard to Figure 1 should be discarded.

Ⅲ. Conclusion

Electromagnetic waves can be classified into by two types from a morphological perspective. In other words, the electromagnetic wave exists independently on the wave model and particle model. This is determined by the motion of electrons. For example, moving electrons (current) produce electromagnetic waves in the wave models, and the stationary electrons emit electromagnetic waves in the particle model.

All electromagnetic waves of the wave model have the structure of radio waves, while the all electromagnetic waves of the particle model have the structure of light waves. The form of radio waves is composed of the concentration of the magnetic field wave and the space current. However, the form of light waves is composed of the concentration of the photo current and the photo magnetic. From this perspective, the concept of <radio waves = electric field wave + magnetic field wave> is not established. In other words, the model of the electromagnetic waves from Figure 1 should be discarded.

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* Difference becomes specialty, Ideal becomes reality,
at the center of world in the name of center

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