

## Energy Body Theory that explains the origin of everything in the universe.

Ichiro Nakayama

Yazucho Yazugun Tottoriken Japan

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### Abstract

I searched for the root of phenomenon and discovered that the origin of the universe is a simple structure. In other words, it was found that space is made up of infinitesimal grains, and they are in such a relationship that when one contracts, the other expands.

The contraction and expansion of these grains form elementary particles, which are substances. It also forms gravitational fields and dark energy fields as spatial distortions.

This discovery follows the law of conservation of energy and complies with the theory of relativity. And the universe circulation system can be predicted.

The gravitational field is a positive energy field in which grains in the space around a star contract and form layers arranged in a spherical shape. The dark energy field is a negative energy field in which grains of space expand and form layers arranged in a spherical shape from the edge of the universe. An elementary particle is an excited state of space in which the expansion and contraction of grains in space rotate while shifting the phase. The center part represents character of a particle, and the foot part represents a character of field.

Matter moves as it is dragged along by kinetic energy, which is waves generated in space. The kinetic energy of an electron separates from the electron and becomes a photon.

Dark matter is a gravitational field. The dark energy field also explains the isotropic acceleration of galaxies moving away from each other and the existence of the cosmic background radiation. Also, contrary to the Big Bang theory, the universe circulation system predicts the existence of older, more mature galaxies the farther out into space.

I found the following about elementary particles. 1. The speed of a photon is different from the speed of light 2. The reason for the principle of constant speed of light, 3. Coulomb's constant, the speed of light, and Planck's constant are the same thing 4. The field is the foot of a particle. 5. The reason why an electrical field and a magnetic field are at right angle each other. 6. The reason why an electron and a proton have the same charge. 7. A magnetic field is created around electric current. 8. The appearance of electrical current and the way how electrical energy is transported, 10. Antiparticles are particles that move in the opposite direction of the particles, etc.

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## **X1. Overview**

### **X1.1. Source of energy**

The origin of the universe is a simple structure. That space is an organization filled with grains much smaller than elementary particles. The grains are independent of each other, so if one grain contracts, the adjacent grain expands. Or vice versa. A contracted grain has positive energy as a restoring force, and an expanded grain has negative energy as a restoring force. This is the source of energy. This shows that the law of conservation of energy holds true universally. Further, the recovery speed of the contraction/expansion of the grains is the speed of light. Therefore, I decided to call the space an energy body and the grains that make up the space energy cell bodies.

### **X1.2. Spatial excitation**

An elementary particle is a state in which a group of energy cells rotates as a wave while contracting and expanding around a local point.

Elementary particles move as they are dragged along by kinetic energy, which is waves generated in the space in front of elementary particles. The movement of elementary particles is the movement of energy (expansion and contraction) of the energy cell groups that make up the elementary particles. Particular attention must be paid to the fact that the energy cell bodies that make up the elementary particles do not move. When elementary particles come into contact, an attractive or repulsive force acts depending on the direction of the mutually rotating waves at the point of contact.

### **X1.3. Distortion of space 1: Gravitational field**

A gravitational field is a distortion of space in which the energy cell bodies of space are contracted. A gravitational field is a space in which energy cell bodies are arranged in a spherical shape (called space layers), and the space layers surrounds a matter in the center.

The gravitational field is dark matter and a positive energy field.

The positive energy amount of the space layer that forms the gravitational field becomes smaller as you get closer to the center of the star. This is because the volume of the space layer becomes smaller, so the positive energy amount becomes smaller.

Elementary particles in a gravitational field feel the energy difference between space layers as gravity. Note that this elementary particle is a state in which the energy cell bodies are excited.

### **X1.4. Distortion of space 2: Dark energy field**

A dark energy field is the place where space is distorted, that means of which energy cell bodies expand and are arranged in a spherical shape.

When a gravitational field is formed, also a dark energy field is formed in a spherical shape outside the gravitational field as a pair of the gravitational field. Because the formation direction is outward, it merges with other dark energy fields and becomes one dark energy field throughout the universe.

A dark energy field is a negative energy field. The closer you get to the edge of the universe, the larger the space layer becomes, and therefore the more negative energy there is. Elementary particles in a gravitational field feel the energy difference between space layers as dark energy. This is why galaxies move away isotropically and at an accelerating rate.

### **X1.5. Waves in space**

Kinetic energy is a wave created in space. Material particles move as they are dragged along by kinetic energy, which is this wave. A photon is a kinetic energy detached from an electron.

### **X1. Supplement 1: Surplus energy and matter**

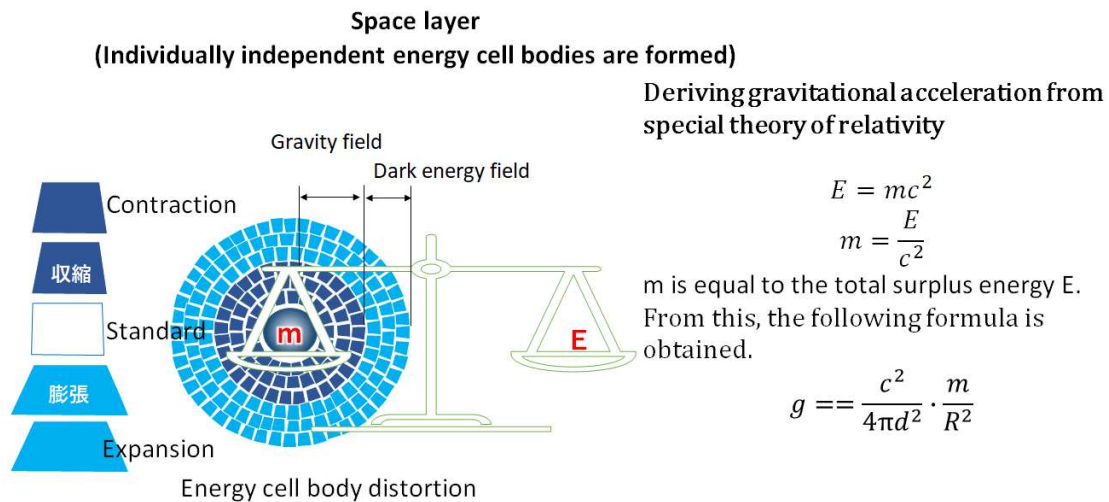
When energy of space layer collapses, surplus energy is generated. And it creates elementary particles.

The elementary particles produced by the surplus energy become the materials for star growth. Therefore, the mass  $m$  of the star and the excess energy  $E$  generated during the formation of the gravitational field are approximately equal.

Therefore, the gravitational acceleration is derived from the following equation of the special theory of relativity.

$$E = mc^2$$

For calculation details, see X24.



In any space layer, the distortion (expansion/contraction) of the energy cell bodies are the same.

Fig.X1-1

### **X1. Supplement 2: Simultaneous generation of gravitational field, dark energy field, and elementary particles**

Gravitational field, dark energy field, and elementary particles are generated by the trinity.

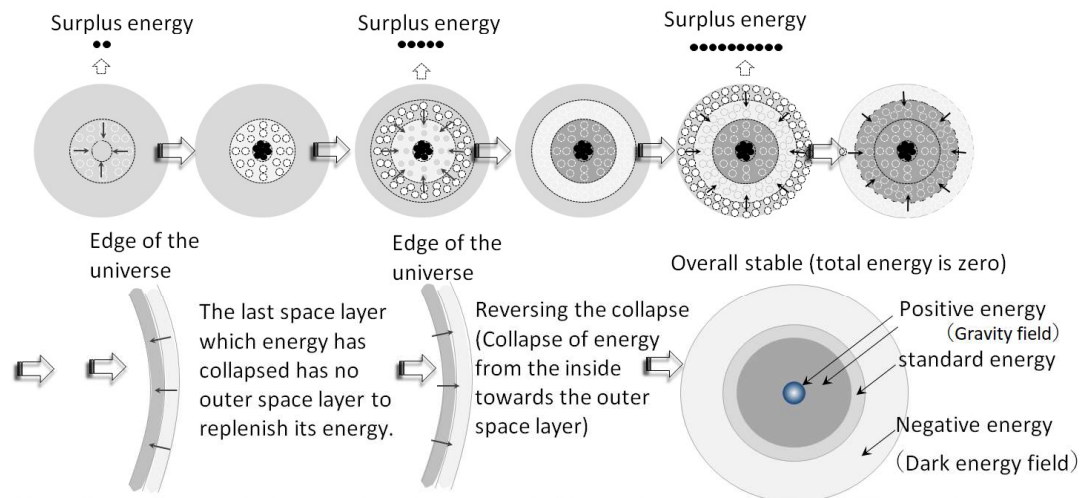
When the energy of the outer space layer collapses into the inner space layer, surplus energy is generated due to the difference in volume between the inner and outer space layers.

The excess energy is in a gravitational field of positive energy. The surplus energy becomes the energy for producing elementary particles. After elementary particles are produced, the elementary particles form a molecular cloud, which is attracted by the shell and promotes star growth. The inside space layers form a gravitational field of positive energy. A dark energy field of negative energy is formed outside of it.

The collapse of energy in the space layer continues until the end of the universe, When the collapse reach the edge of the universe, energy swings back toward the inner space layer and becomes stable.



**Trinity generation of gravitational field, dark energy field, and elementary particles  
(Chain of space layer energy collapse)**



The collapse of energy in the space layer is accompanied by surplus energy due to the difference in volume between the inside and outside.

The surplus energy is within the positive energy gravitational field and becomes the energy for elementary particle production.

A gravitational field of positive energy is formed on the inside, and a dark energy field of negative energy is formed on the outside.

After the space layer collapses, it swings back and stabilizes after reaching the edge of space.

Fig.X1-2

**X2. Structure and basic principles of the universe 1**

The universe, galaxies, stars, matter, even the smallest elementary particles, dark matter, dark energy, and light that we think exist in space are all excitations or distortions of space.

In other words, this world is made up of space. Conversely, space is the only real thing in this world.

We believe that galaxies, stars, elementary particles, and light exist independently in outer space and move freely through space. However, in reality, galaxies, stars, elementary particles, dark matter, dark energy, and light, these are parts of the body of space, which are deforming, shrinking and expanding. Their movement is just only shifting of their energy. As a result, they move. In the end, space is the only real entity in the entire universe.

Matter is a locally excited state in space, and the movement of matter is a transition of the excited state in space. We can exercise by running, jumping, and falling from heights. This is because there is kinetic energy. Can we answer the question, "What is kinetic energy?" Kinetic energy is a wave generated in space. Matter is dragged along by these waves and moves. Matter is also dragged along because it is an excitation of space.

Fig.X2 classifies spaces (energy bodies) according to their aspects.

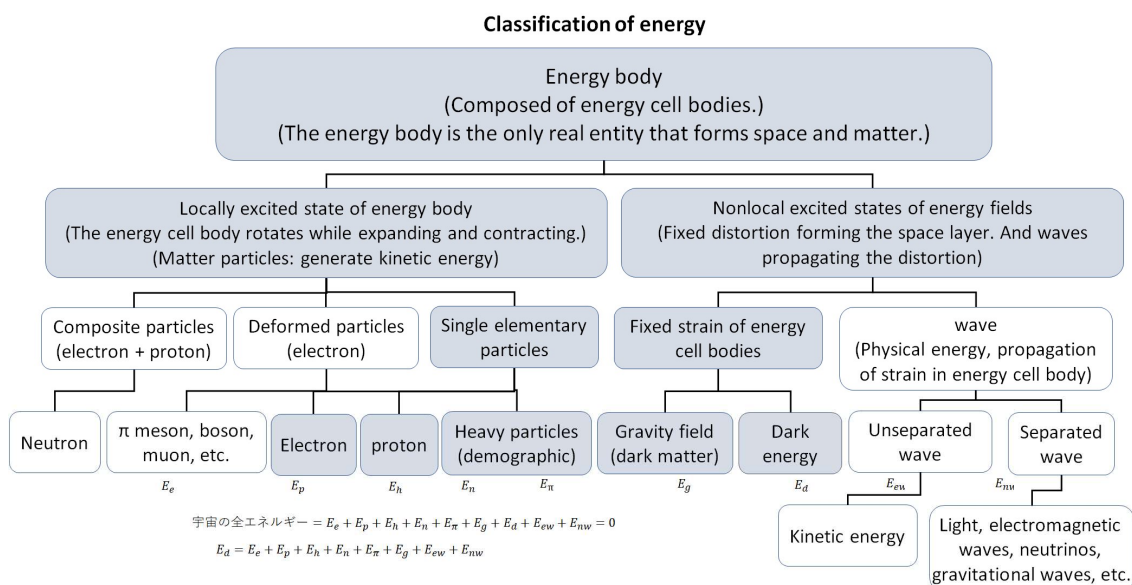


Fig.X2

### X 3. Structure and basic principles of the universe 2

The structure of the universe and all fundamental physical phenomena are explained by the following three axioms.

1. All beings and phenomena in the universe consist of a single element (called an energy body). Both the vacuum space and matter (elementary particles) are the same energy bodies. Therefore, if the energy body does not exist, neither matter nor space exists.
2. Energy bodies are composed of independent microscopic something like grains (called energy cell bodies) that are much smaller than elementary particles.
3. All interactions are due to differences in energy density between systems of energy bodies.

### X4. Source of energy

The source of energy is explained by the followings:

1. When one energy cell body (group) contracts or expands due to external energy, the adjacent energy cell bodies (group) always expand or contract.

The speed of contraction or expansion of energy cell bodies in a vacuum is the speed of light. If the expansion and contraction of space occurs locally with time changes, it is a vibration that forms elementary particles, if it does not involve time changes, it is a

gravitational field or dark energy field, and if it moves by itself, it becomes a wave. However, energy remains in equilibrium throughout space.

2. Energy cell bodies have a restoring force that is proportional to the percentage of change in volume from the standard state volume. This restoring force is energy. The contracted energy cell body tries to return to its normal state by releasing energy outward. Conversely, expanded energy cell body tries to take energy inside.

#### **X4. supplement**

Suppose that certain energy cell bodies (group) contract. Adjacent energy cell bodies (groups) expand to create no gaps. This is because there should be no gaps.

Expansion and contraction of energy cell bodies always occur in pairs.

A contracted energy cell body has positive energy, and an expanded energy cell body has negative energy.

Since both always occur in pairs, the total remains zero.

This is the fundamental reason why the law of conservation of energy always holds true.

Naturally, when you add up the positive and negative energy throughout the universe, it becomes zero.

#### **X5. Genius physicists who considered space**

Two great physicists who considered space lived almost contemporaneously.

"Space is made up of microscopic something like grains. Elementary particles are the excited energy states of space." (Elementary Domain Theory by Hideki Yukawa)

"Gravity is the distortion of space-time. Inertial force is the drag of space." (Theory of Relativity Einstein)

"Space is made up of microscopic something like grains, and elementary particles are the excited states of the microscopic grains that make up space."

The idea that elementary particles, or matter, are locally excited states in space was proposed by Hideki Yukawa and others already 50 years ago. Hideki Yukawa's power to feel was outstanding.

"Space consists of indivisible minimum regions, and elementary particles occupy any of them. Let's call this minimum region the elementary domain. Theory" Hideki Yukawa, Iwanami Shorten)

"When a certain amount of energy is added to one of the elementary regions, it can be distinguished from other elementary regions and appears to be an elementary particle. After the next separation time, energy is added to one of the other elementary regions. Then, the elementary particles have moved there far from the original elementary domain. "The World of Elementary Particle Theory" by Yasuhisa Katayama, Kodansha, BLUE BACKS, published in 1971.

I was also surprised by Einstein's sensibility that "inertial force drags space." This is also the origin of the energy body theory, which states that matter is dragged by waves (kinetic energy) generated in space.

#### **X6. Space layer**

The energy cell bodies that fill space is the smallest area of space. It can be said that this is Hideki Yukawa's elementary domain.

Assume an extremely thin spherical surface in this space. The shape of the energy cell bodies that touch the spherical surface is distorted and arranged on the spherical surface. This is the space layer.

#### **X7. Generation of elementary particles, gravitational fields (dark matter), and dark energy**

The collapse and replenishment of energy in the space layer produces gravity field, dark energy field, and elementary particles.

Due to the uneven distribution of surplus energy due to fluctuations, local energy cell bodies in space are excited (compressed) and elementary particles are born. Then, countless elementary particles come together to form matter.

Matter is a myriad of contracted energy cell bodies. Therefore, the outside of matter is surrounded by space layers of expanded energy cell bodies in low energy. This space layer has negative energy because some of its energy has been transferred to the inside space layer. Therefore, energy flows in from the energy cell body outside of it, in the standard energy state. As a result, space layers where energy cell bodies are contracted and become highly energetic around the outside of the material. Then, space layers in a low energy state that expands to the outside are formed.

The collapse and replenishment of the space layer's energy continues repeatedly until the end of the universe.

When the collapse reaches the edge of the universe, there is no energy flowing in from the outside, so, this time in the opposite direction, energy of the inside space layers flows back into the outside space layer and becomes stable.

Then, a gravitational field, which is made of high-energy space layers, is created around the star, and a dark energy field, which is made of low-energy space layers, is created outside of that.

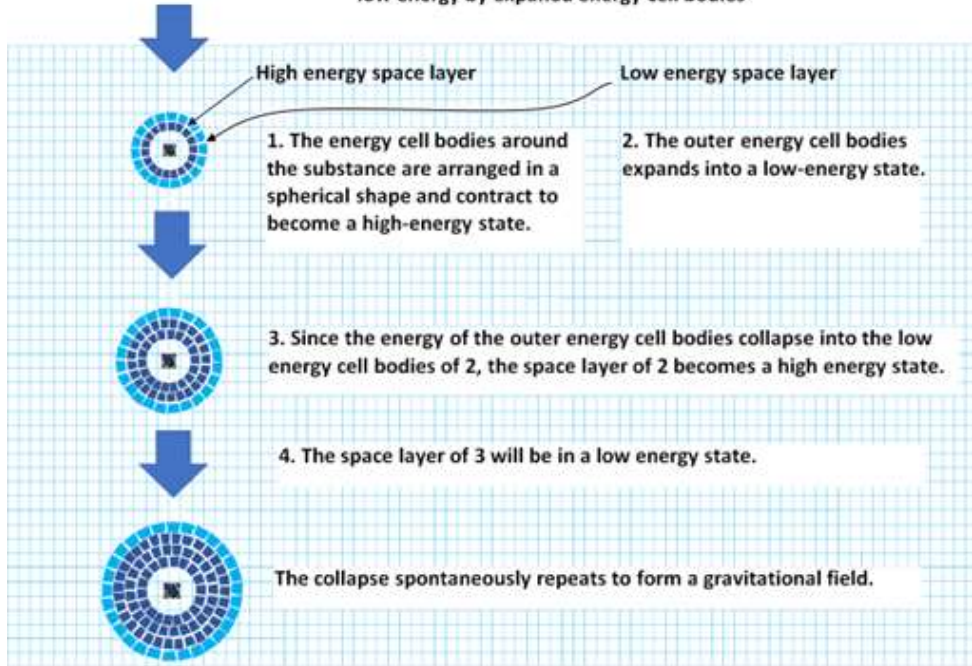
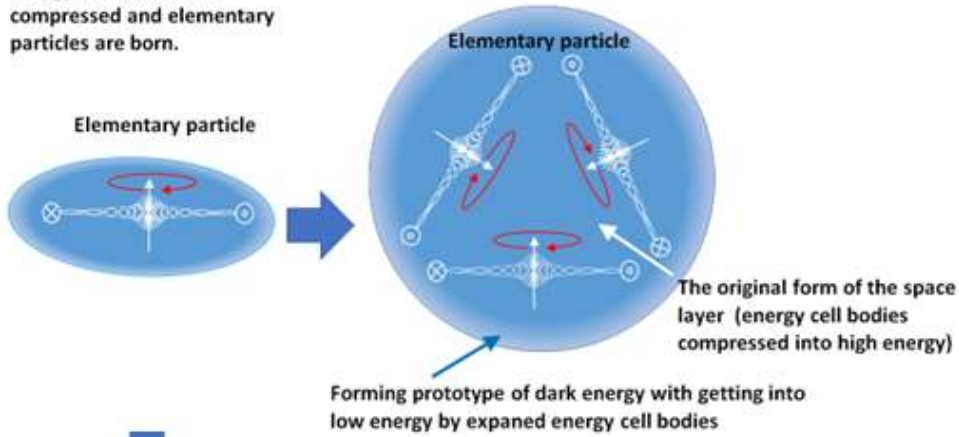
Gravitational fields and dark energy fields are concrete examples of the spatial distortions of the theory of relativity.

When energy flows from the outer space layer to the inner space layer, surplus energy is generated due to the difference in volume. This surplus energy gives birth to elementary particles. Elementary particles generate molecular clouds due to electromagnetic force. Molecular clouds are attracted to a substance due to gravitational force, and the substance grows. This collapse and replenishment occurs repeatedly and grows into a star.

## Overview of Generation of Gravitational and Dark Energy Fields

Due to the uneven distribution of energy in spatial localities, energy cell bodies are compressed and elementary particles are born.

When multiple elementary particles gather, the energy cell bodies in the space around the elementary particles form space layers.



The contraction rate per one energy cell body is the same for any space layer. Therefore, surplus energy is generated when energy collapses from the outside to the inner space layer. This surplus energy creates elementary particles.

Energy density comparison of energy cell bodies



The grid-like background depicts the energy cell bodies that make up the space.

Contraction and expansion of energy cell bodies are changes in energy density due to changes in shape.

Fig.X7

### X8. The cause of gravitational force.

Gravity is the magnitude of the impulse that elementary particles perceive the energy difference between the outside and inside layers of space and move to the lower-energy side. The energy difference is in the direction of the center of the sphere. In order for impulses to become actual movements, the production of kinetic energy is additionally required.

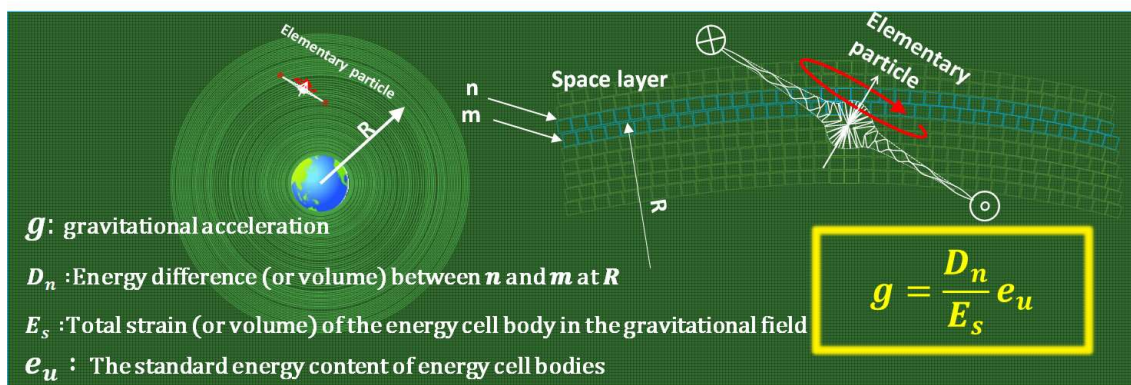


Fig.X8

### X9. Shape of elementary particle

An elementary particle is local energy cell bodies in space that rotates (spins) with a phase shift while repeating contraction and expansion in celestial sphere from a single point.

The central part shows the character of a particle.

The spreading foot shows the character of a field.

The interaction is determined by the direction of the rotating waves relative to each other at the point of contact. If they are in the same direction, there will be an attractive force, and if they are in different directions, there will be a repulsive force.



## Elementary particle model of Energy Body Theory

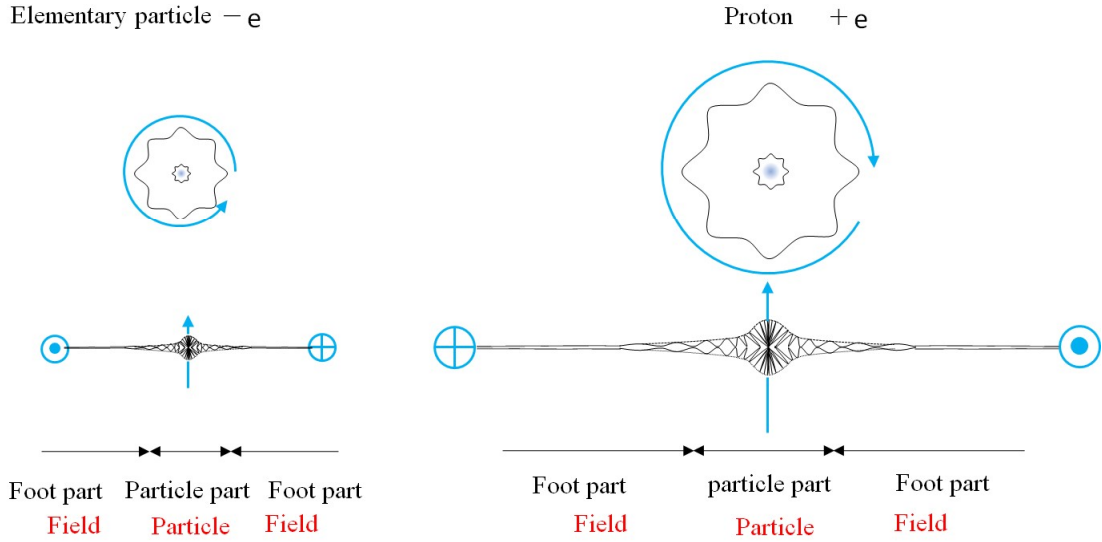


Fig.X9-1

## Electromagnetic interaction

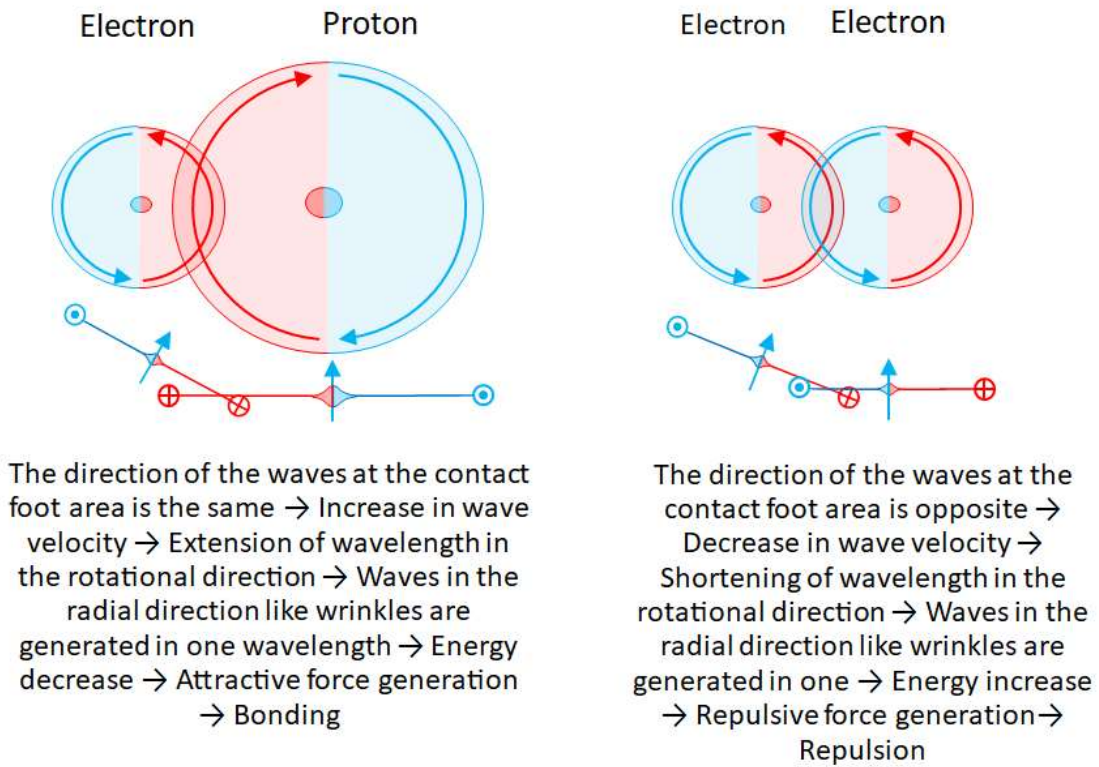


Fig.X9-2



**X9. supplement**

The central particle part has the character of a particle, and the thin, spreading foot part has the character of a field.

The expansion and contraction of energy cell bodies and rotating waves form material particles and trap energy.

When an external force is applied to an elementary particle, it generates waves (kinetic energy) in the space in front of it.

Elementary particles move as they are dragged along by these waves.

Note that since elementary particles are locally excited in space, their movement is a movement of a locally excited state in space.

Mass is the element that determines the speed of the generated waves.

In particular, a wave (kinetic energy) that separates from an electron is called a photon.

**X10. Generation of elementary particles 1**

Surplus energy generated during the gravitational field formation process brings local areas of the gravitational field into a high energy state. When pressure is concentrated at one point in space, the energy cell bodies contract toward that point. Then, the energy cell bodies around the outside expand. Note that the energy cell bodies of the gravitational field cannot absorb excess energy because it is fixed in a spherical shape.

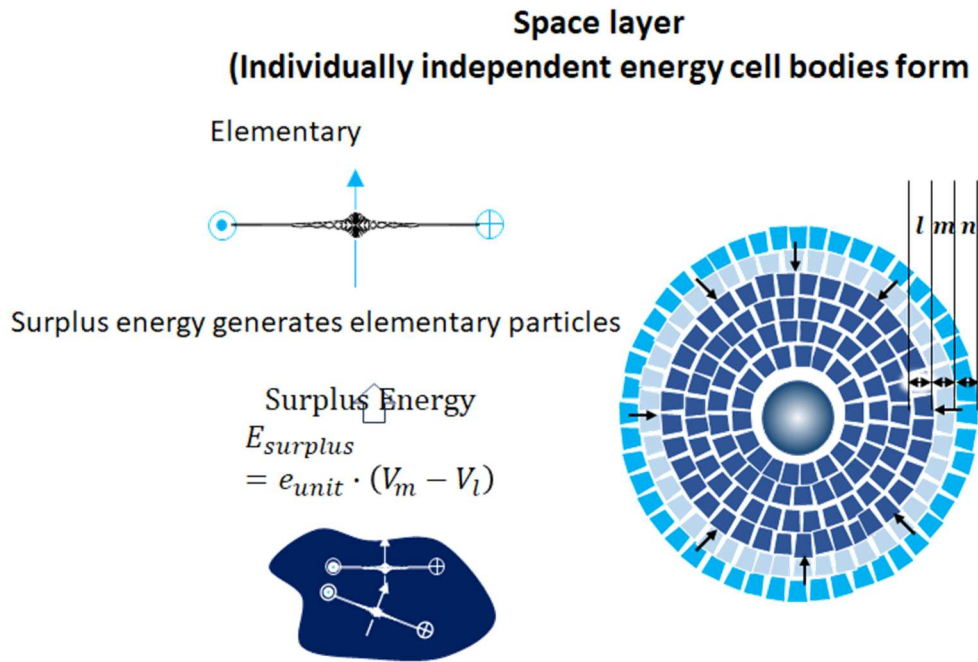


Fig.X10

This is the state in which the energy  $e_{unit} \cdot V_m$  of space layer  $m$  collapses into space layer 1. As a result, the following surplus energy is created in the gravitational field.

$$E_{surplus} = e_{unit} \cdot (V_n - V_m)$$

The surplus energy excites energy cell bodies at local area and becomes elementary particles. Note that the energy cell bodies in the gravitational field cannot absorb surplus energy.

### X11. Generation of elementary particles 2

When the outer space layer collapses energy into the inner space layer, surplus energy arises from the volume difference between the outside and inside space layers.

This surplus energy becomes the raw material for producing elementary particles.

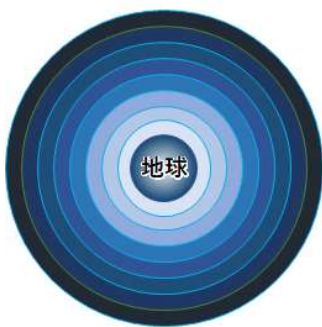
### X11. supplement

The energy density of the gravitational field is the same everywhere, regardless of distance from a star. This is because the distortion rate of the energy cell body is the same everywhere regardless of distance. The reason why gravity still works is because the energy cell bodies are distorted along the spherical surface. The difference in volume between the outside and inside space layers results in a difference in the amount of energy in the space layer.

For this reason, matter (elementary particles) receives the difference in energy amount due to the size of the outside and inside space layers as gravity.

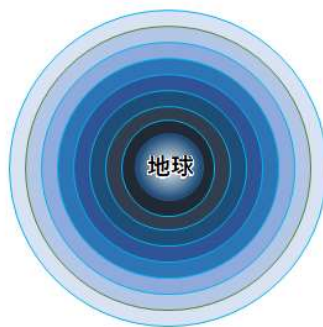
### Space layer energy density

The closer to the center, the lower the energy density.



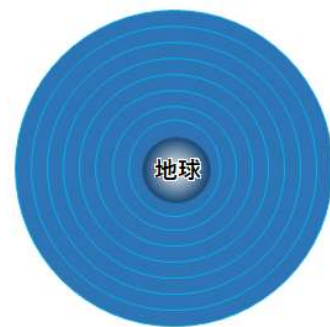
**Incorrect.**

The closer to the center, the higher the energy density.



**Incorrect.**

The energy density is the same everywhere regardless of the distance from the center.



**Correct**

Fig.X11

### X12. Generation of elementary particles 3

When a stronger pressure which exceeds energy cell body's ability to contract is applied to that, the pressure start rotating in search for the energy to go. Because the pressure escape, shrunk energy cell bodies start expanding. In this way, the surplus energy begins to rotate (spin) while expanding and contracting, shifting the phase. This is the birth of elementary particles.

#### Elementary particle formation process

Excitation of the energy cell body group receiving pressure from all celestial spheres due to surplus energy → Start of vibration and rotation

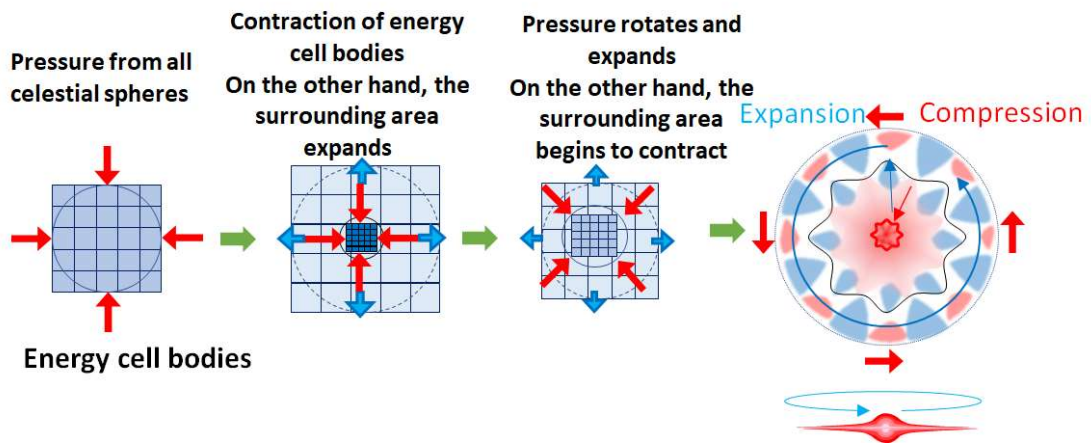


Fig.X12-1

## Appearance of electrons

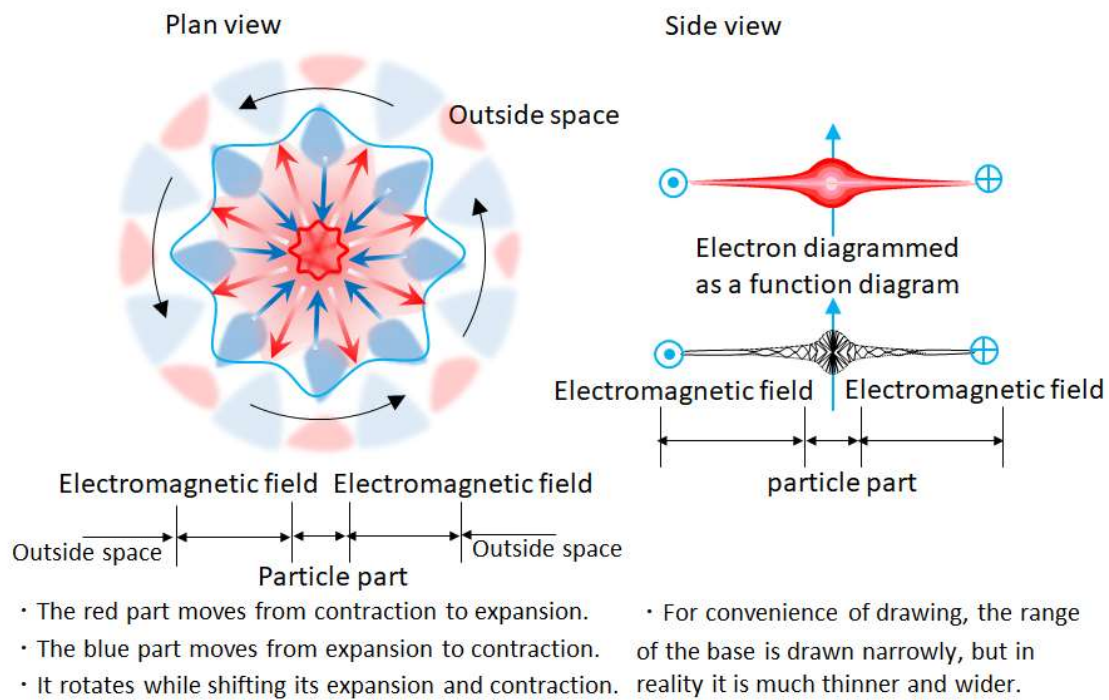


Fig.X12-2

### X12. Supplement 1: Contraction and expansion of the energy cell body

The surplus energy generated in the gravitational field receives pressure from the gravitational field because of the surplus. Therefore, the local energy cell bodies in space contract toward the sphere center and become high energy. On the other hand, the surrounding energy cell bodies expand and enter a low energy state. This is because contraction and expansion of energy cell bodies occur in pairs. The principle is similar to the vibration of a spring.

When pressure is further applied from the gravitational field, the pressure has nowhere for its energy to go and it begins to rotate. Then, the energy cell bodies that had contracted to one point now begins to expand outward. Also, the surrounding energy sell bodies that had expanded try to contract and return to their original state.

This contraction and expansion rotate out of phase and become waves. In other words, elementary particles are waves in which energy cell bodies rotate out of phase while expanding and contracting.

### X12. Supplementary 2: Spin Features

Spin has an important function in conserving the shape and energy of elementary particles.

Spin is not a rigid body rotating round and round, but a wave in which the phase of expansion and contraction shifts in the direction of rotation. Care must be taken on this point.

Also, in quantum mechanics, spin is divided into types such as half-integer, up, and down, but this is a phenomenon that occurs in relation to external magnetic fields. It is not a property of the elementary particles themselves. This is a misunderstanding that occurs because the relationship between fields and particles is not well understood. This misunderstanding complicates understanding of elementary particles.

Spin is the cause of electromagnetic force, strong force, weak force, etc.

### X13. Gravitational field and dark energy field

#### X13.1. Superposition and merging

The energy cell bodies of a gravitational field are distorted toward the center of the sphere; thus, the gravitational field is anchored to the star. The energy cell bodies of a dark energy field are distorted outside the sphere; thus, the dark energy field extends throughout the universe, and are as many as stars. The dark energy field becomes one in the universe. the gravitational field is fixed to the stars,

This is what causes stars, galaxies, star clusters, and large-scale structures in the universe to move toward the edge of the universe at an accelerating rate.

#### Superposition of gravitational fields and unification of dark energy

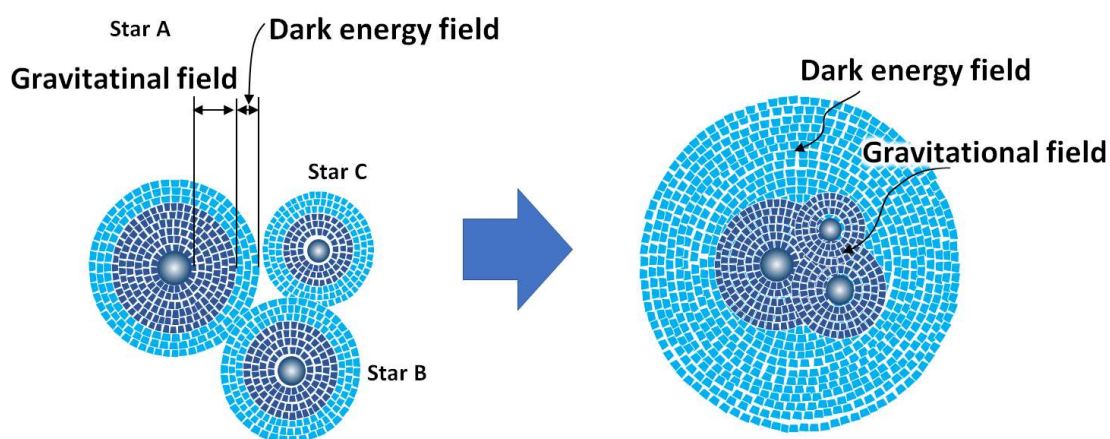


Fig.X13.1

#### X13.1. Supplement 1: Dark energy field

The dark energy field is made of space layers that spreads throughout the universe, forming from the edge of the universe to the center of the universe. The energy cell bodies of the space

layer are expanded layers of negative energy.

The collapse of energy in the space layer, that occurs when a gravitational field is formed, could theoretically reach the edge of the universe. After the collapse reached the last space layer at the edge of the universe, there is no outer layer, so there is no space layer to compensate for the energy lost due to the collapse. Therefore, energy is replenished from the inside space layers by swinging back. Then, the gravitational field and dark energy field become stable.

### **X13.1. Supplement 2: dark matter**

Dark matter is a gravitational field.

The gravitational field of the energy body theory fits well with the following characteristics of dark matter.

- Dark matter accounts for almost a quarter (27%) of the average energy density of the current universe.
- Dark matter cannot be seen through observation using electromagnetic waves.
- Dark matter exerts gravitational interaction like baryons.
- Dark matter attaches to all the countless galaxies in the universe.

### **X13.2. Energy density**

The energy density of the dark energy field is the same everywhere, regardless of the distance from the edge of the universe. This is because the distortion rate of the energy cell bodies does not depend on distance.

The reason why dark energy works is that the energy cell bodies of the dark energy field is distorted along the spherical surface. Like the gravitational field, it is a distortion of space, but the gravitational field is a positive energy field. In contrast, a dark energy field is a negative energy field. The closer you go to the edge of the universe, the larger the volume of the space layer becomes, and the more negative energy there is.

For this reason, matter (elementary particles) receives the difference in energy amount depending on the volume of the outside and inside space layers as dark energy.



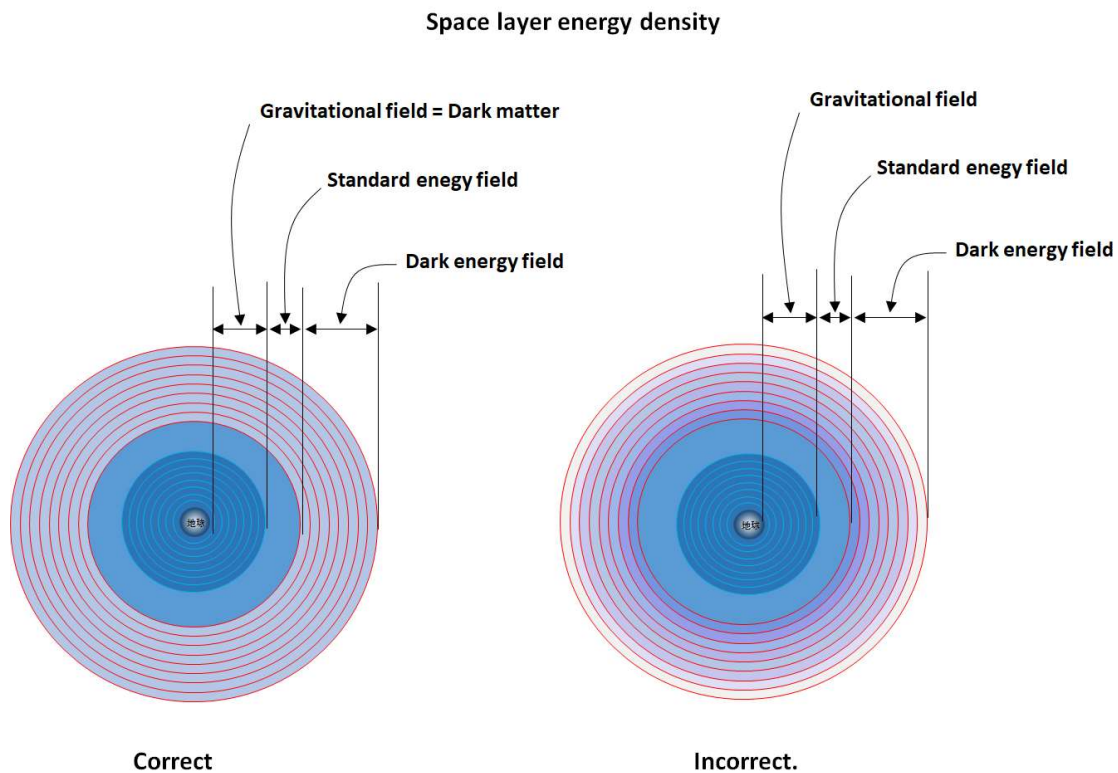


Fig.X13.2

### X13.3. Space layer energy collapse

A low-energy space layer forms around the nascent material. Energy from the outside space layer collapses into this space layer.

In this way, the energy of the space layer collapses repeatedly, forming a gravitational field, but in the process, surplus energy is generated. The surplus energy becomes a molecular cloud that causes the initial material to grow and become a star.

### X13.4. Cause of accelerated expansion

The dark energy field becomes more negative energy as you go to the edge of the universe.

The reason is that the volume of the space layer, which is the energy cell bodies that has expanded and has negative energy, increases. This is why galaxies move away isotopically and at an accelerating rate.

### X14. Energy throughout the universe

Matter such as stars and galaxies are positive energy.

The gravitational field surrounding stars, galaxies, etc. is the space in which energy is positively distorted (the energy cell bodies of the space layer contract).

The entire universe, excluding matter such as stars and galaxies, and their gravitational fields, is the space which energy is negatively distorted (the energy cell bodies of the space layer expand).

Positive energy and negative energy are balanced throughout the universe and are total zero. This is obvious from the principle of contraction and expansion of energy cell bodies. When an energy cell body contracts, the surrounding energy cell bodies inevitably expand.

Note that matter is in a state where the local area in space is expanding and contracting while shifting the phase in the rotation direction.

The movement of matter is the movement of only energy (local excitation in space).

### **X15. Evidence of the Big Bang**

The following observations, which are said to be evidence of the Big Bang, are also thought to be explained by the cosmic circulation system of the energy body theory.

**Cosmic microwave background radiation:** Stars, galaxies, galaxy clusters, and even large-scale structures are transported to the edge of the universe as they are, while accelerating, and arrive at the edge of space where is in most low-energy space (expansion of energy cell bodies). And there, they explode, melt into space (energy body). It is thought that microwave background radiation is the 3000k black body radiation emitted by the explosion and melting was extended to 3k due to the Doppler effect.

**Uniform isotropy (expansion):** Since the space layers that forms the dark energy field in the entire universe are as big as the entire universe, stars and galaxies are expected to be transported toward the edge of the universe isotropically. It is thought that the problems of the Big Bang theory mentioned in X16. which were solved by the inflation theory, can be explained by “the universe circulation system” of the energy body theory.

**Flatness:** The universe is thought to be flat due to endless “the universe circulation system”.

**Horizon Problem:** Due to one dark energy field throughout the universe and the universe circulation system in which time flows forever, the universe is more or less the same everywhere.

### **X16. Questions about inflation theory and big bang theory**

Are the energies that caused the three-stage events of the birth of the universe, inflation, and the Big Bang different in nature, or are they a transformation of energy?



**Birth of the universe:** What mechanism created the universe and what kind of energy does it have?

**Inflation:** Immediately after the birth of the universe, after  $10^{-36} \sim 10^{-32}$  seconds, the universe rapidly expanded to a size close to that of the present universe. But what kind of mechanism and what kind of energy? It's an unexpected scale and speed that violates "the law of conservation of energy" and "the theory of relativity".

**Big Bang:** Due to mysterious dark energy, it continues to expand slowly and at an accelerated rate. Dark energy is a mysterious energy that violates "the law of conservation of energy", where its density does not change even if the universe expands.

#### **X16. Supplement; Prediction of older and more mature galaxies existing in the distant universe.**

According to the Big Bang theory, galaxies should become younger as they are located more farther in space. However, the energy body theory predicts that more and more older galaxies will be found in farther and farther distant universe. The mysterious quasars may also be exploding and melting galaxies transported to the edge of the universe.

#### **X17. The universe circulation system**

The cause of isotropic separation of stars is "the universe circulation system".

The stars, the gravitational field, and even the large-scale structure of the universe have positive energy, so they are carried to the edge of the universe as they are. Because energy is negative at the edge of the universe, so they return into the universe (elimination of excited energy cell bodies) while exploding and melting.

## The Universe Circulation System A

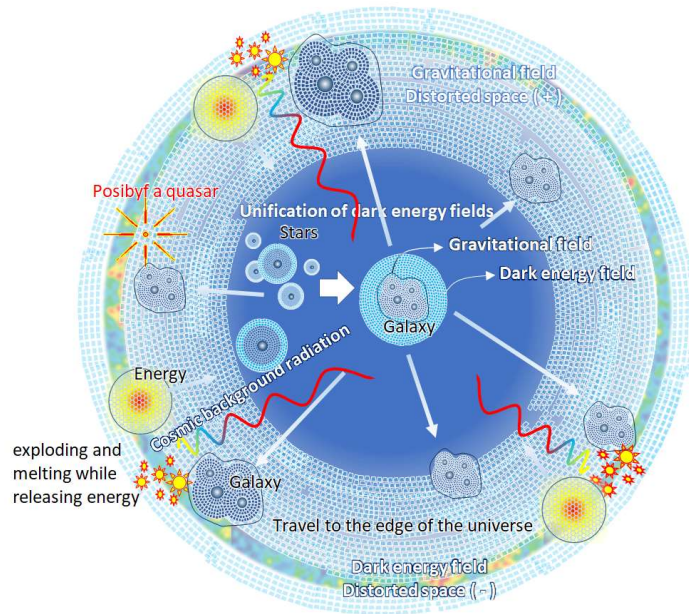


Fig.X17-1

## The Universe Circulation System B

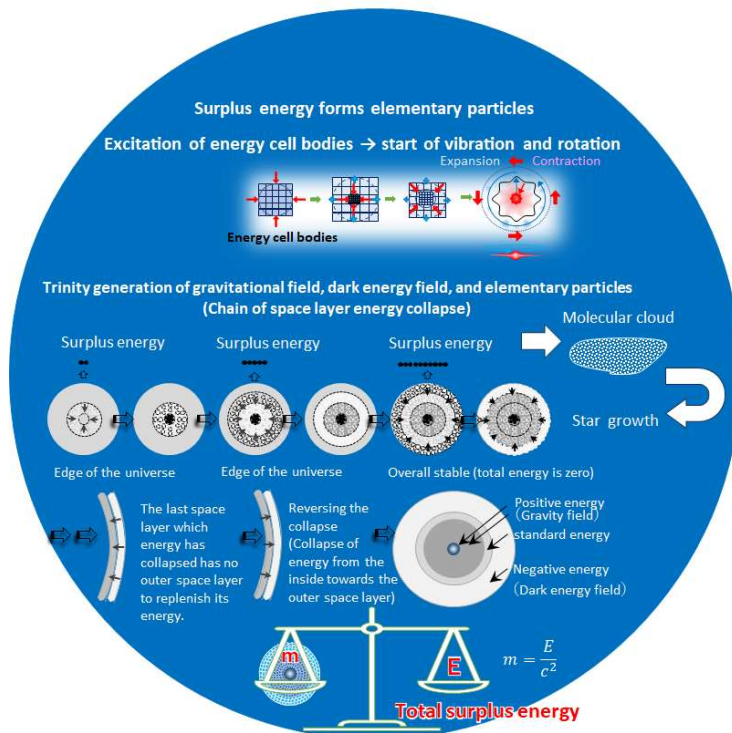


Fig.X17-2

### **X18. Consideration of outer space**

"How can stars and galaxies float in the vacuum of space?"

"Why does gravity attract all different things?"

This was the impetus for my discovery of the energy body theory.

Then, I simultaneously discovered a gravitational field, a dark energy field, and a spinning elementary particle model.

### **X18. Supplement: Major new discoveries related to elementary particles.**

I have continued to verify whether elementary particle models based on the energy body theory are compatible with past experimental and observational results. Through the verification so far, I have achieved the point where I am convinced that the elementary particle model of the energy body theory is superior to any current understanding and is the ultimate model.

Furthermore, I found out that it gives reasons to many fundamental principles.

#### **The main discoveries**

- Photon's appearance
- A photon is a wave motion generated in space, that is a kinetic energy separated from an electron (new discovery)
- The speed of photons (new discovery) and the reason for the principle of unchanging speed of light (new discovery)
- Coulomb's constant, speed of light, and Planck's constant are the same (new discovery)
- Field is the thinly spreading foot part of particles (new discovery)
- Clarification of spin
- The reason why electric and magnetic fields are at right angles (new discovery)
- The reason why an electron and a proton have the same charge (new discovery)
- The reason why magnetic field is created around electric current (new discovery)
- The appearance of electric current and the reason why electrical energy is transported (new discovery)
- The Reason for the existence of repulsive core (new discovery)
- Antiparticles are particles that move in the opposite direction to particles (new discovery)

### **X19. The path of light bent by gravity.**

The prophecy of the theory of relativity that still marvels to this day.

The gravitational field is a high-energy field in which space are layered.

The curvature of the path of light is the curvature of the photon's foot, which calculates the speed of light.

The amount of energy in the inside space layer is less than the amount of energy in the outside space layer. Therefore, the photon foot bends toward the inside space layer so that the energy usage is the same.

This bending ends up being the same amount of change as the gravitational acceleration. For this reason, when we look at the tiny portion of a photon, it draws a parabola.

Fig19-1 is a photon model of the energy body theory.

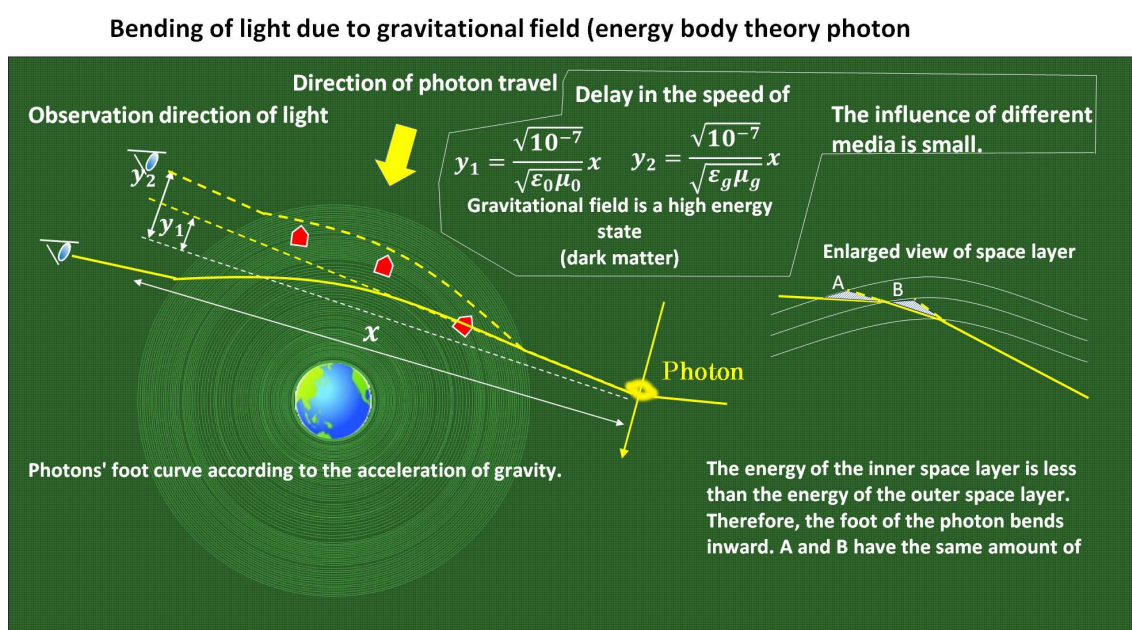


Fig.X19-1

### X19. Supplement: photon

A photon is a wave generated in space, which is the kinetic energy of an electron separated from it. Therefore, the photon continues the inertial motion of the electron just before it leaves the electron.

In a vacuum, photons are not accelerated after being emitted, and the energy of the space they use is constant.

Between different media, the foot of photons is bent in order to keep the change in energy usage due to changes in energy density constant. By bending the photon's foot, the speed of light slows down, and the amount of energy used in the medium per hour remains the same.

In a gravitational field, although the energy density of the medium does not change, there is a difference in the amount of energy between the space layers, which bends the foot of the

photon.

Each time a photon passes through the space layer, it bends, so the change is the same as the change in gravitational acceleration.

A photon separated from an electron continues to widen its foot due to expansion and spin, creating a cavity inside. Please note that the contraction will not be carried over.

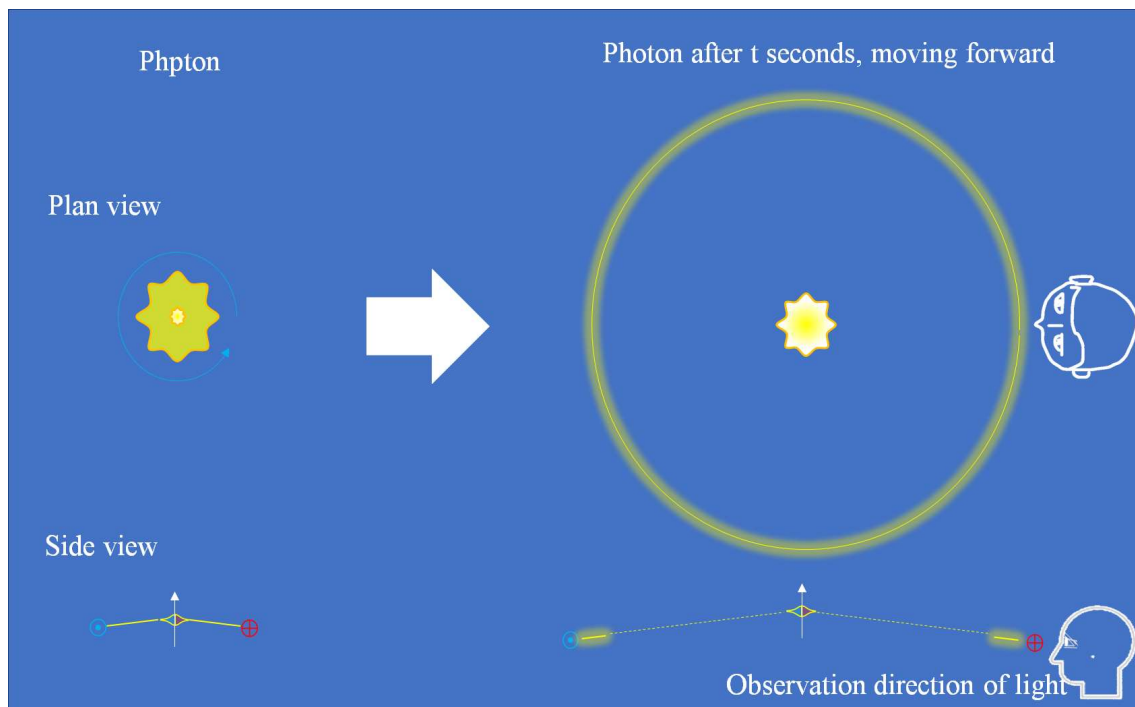


Fig.X19-2

### **X20. The true nature of kinetic energy**

In "the elementary domain theory" of Hideki Yukawa the motion of elementary particles was expressed as blinking an electric bulletin board.

The energy body theory expresses it by blinking dots on the monitor.

Coincidentally the same expression after 50 years

It makes you feel the passage of time in a mischievous way.

Elementary domain theory might have not understood by the reason why the excited state of space moves.

Einstein saw through the essence of nature of motion and space.

"Inertial force is drag of space."

Really awesome.

Energy body theory discovered that material moves being dragged by its waves (kinetic energy) generated in space.

The wave (kinetic energy) that leaves the electron is called a photon.

### Relationship between kinetic energy and photons

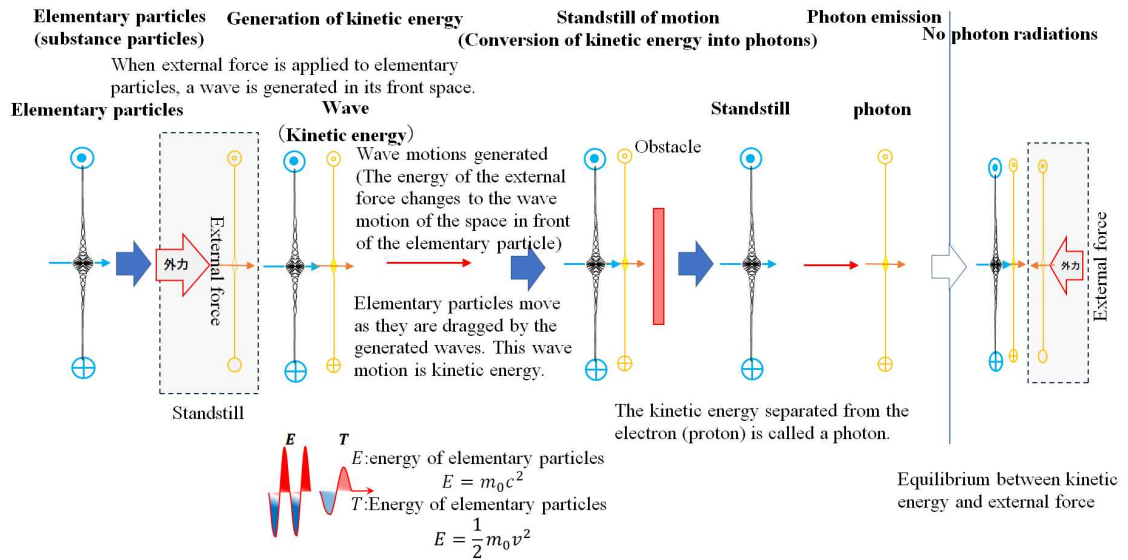


Fig.X20

### X21. Kinetic energy produced by gravity.

Substances (elementary particles) that feel the energy difference in the space layer that forms the gravitational field generate wave motions (kinetic energy) on the earth side.

Substances move (fall) by being dragged by these wave motions (kinetic energy).

Waves (kinetic energy) add up wave motions of energy difference each time they pass through a space layer.



### Gravitational field potential and kinetic energy

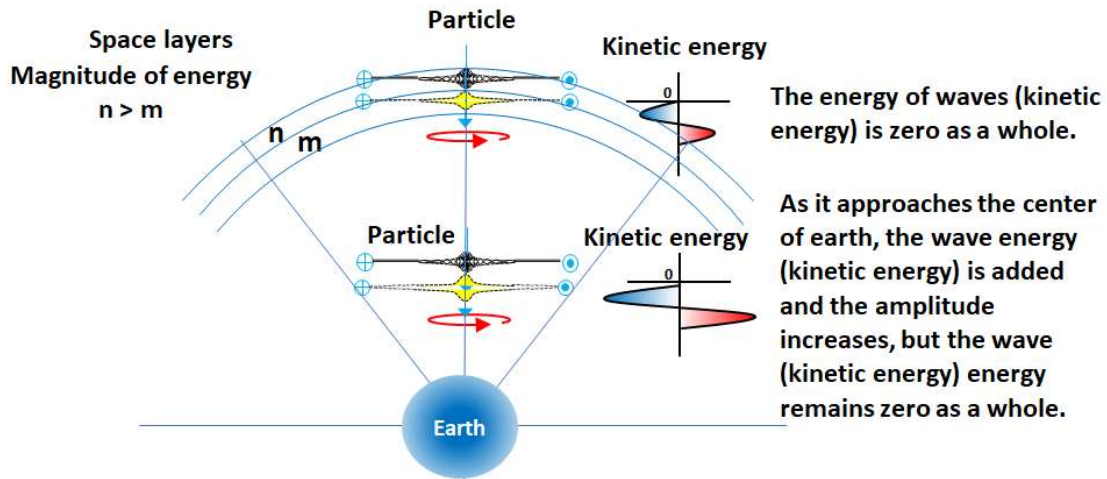


Fig.X21

### X22. Elementary particles and motion in a gravitational field

Elementary particles that enter the gravitational field (excitation of space) do not move nor exist pushing away the energy cell bodies of the gravitational field. The energy that excites the elementary particles transfers energy to the energy cell bodies of the gravitational field, and as a result, the energy cell bodies of the gravitational field become elementary particles. In other words, elementary particles are the excitation of space (energy cell bodies), so only energy is moving.

The same is true for photons. The difference between elementary particles and photons is that elementary particles cannot move unless they are dragged along by kinetic energy, whereas photons themselves are kinetic energy.

### X23. Reason why weak gravity

The space layer that makes up the gravitational field is a very thin spherical surface.

This space layer is made up of energy cell bodies spherically arranged in a distorted shape.

For this reason, the distortion of a single energy cell body is extremely small compared to the contraction and expansion of the energy cell bodies of elementary particles. Moreover, regardless of the distance, the distortion of each energy cell body is the same. Therefore, the energy that substances (elementary particles) in a gravitational field receive from spatial distortions is extremely small.

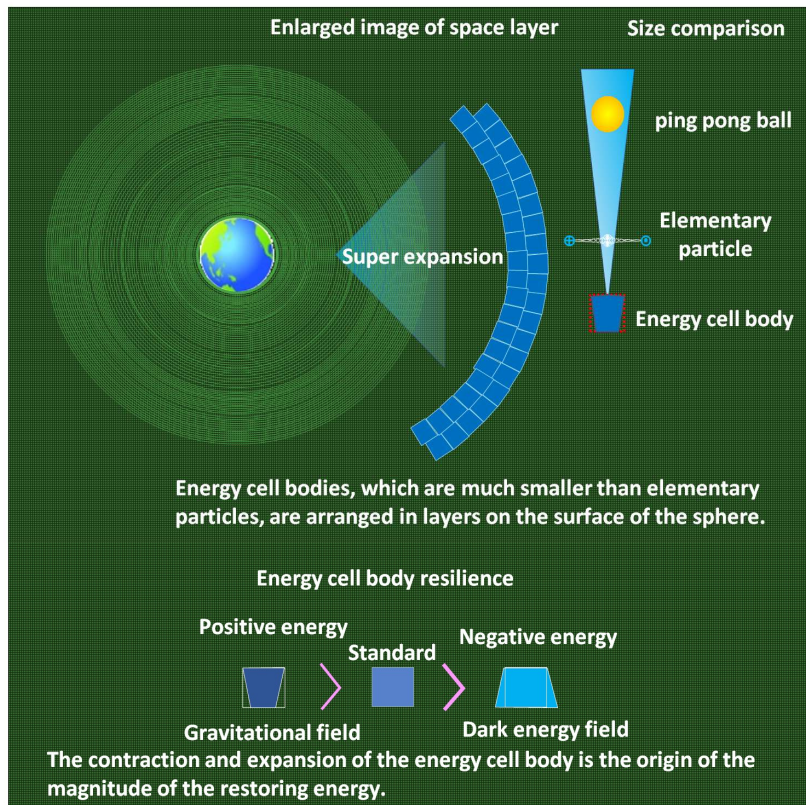


Fig.X23-1

**X23. Supplementary; Distortion rate of energy cell bodies**

The energy cell bodies that make up the space are individually independent tissues. This is very important. Therefore, the distortion of the energy cell bodies of any space layer in the gravitational field is the same. The dark energy field is too.

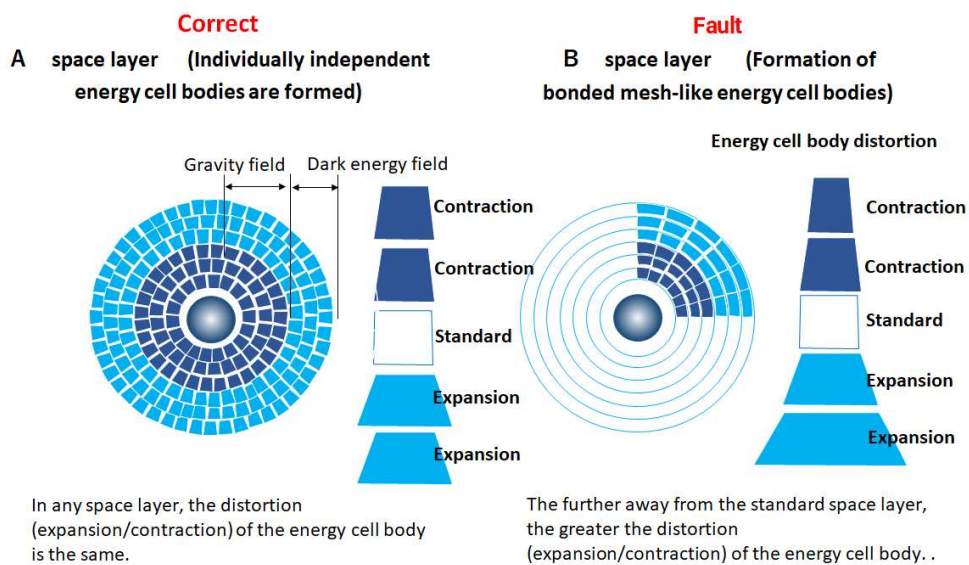


Fig.X23-2



### X24. Energy balance and gravitational acceleration in the universe

Surplus energy is generated by energy influx from outside space layers to inside space layer, energy of the gravitational field is formed by space layers where energy cell bodies are distorted while shrinking. Surplus energy and energy of the gravitational field increase locally in space as positive energy.

On the other hand, negative energy corresponding to the positive energy appears outside the gravitational field. This is because the energy cell bodies that collapsed energy into the inside space layer are distorted (expanded) and lined up in a spherical shape on the outside. As a result, negative energy is always formed outside of positive energy, and the universe as a whole maintains equilibrium.

#### Calculation of gravitational acceleration: Generation process of stars, gravitational fields (dark matter fields), and dark energy fields

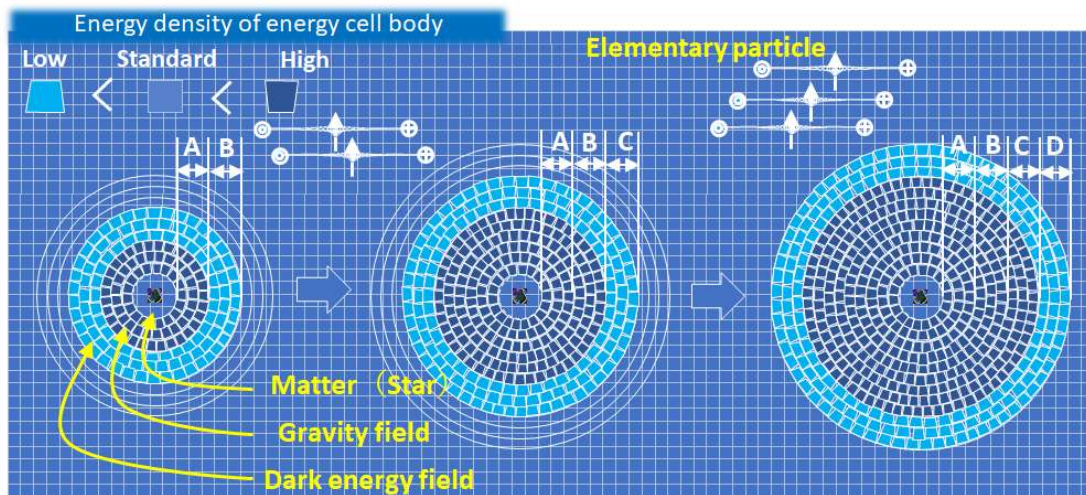


Fig.X24

Also, when the mass  $M$  of the star is converted into energy, the following formula is obtained from the special theory of relativity.

$$M = \frac{E}{c^2} = \frac{1}{c^2} \int D_C \cdot \alpha \cdot e_u dR$$

$$D_C = (V_C - V_B) \cdot \alpha \cdot e_u$$

$$V_C = \frac{4}{3} \pi (R + d)^3 - \frac{4}{3} \pi R^3$$

$$V_B = \frac{4}{3} \pi R^3 - \frac{4}{3} \pi (R - d)^3$$

$$D_C = 8\pi R d^2 \cdot \alpha \cdot e_u$$

$$\therefore M = \frac{1}{c^2} \int D_C \cdot \alpha e_u dR = \frac{1}{c^2} \int 8\pi R d^2 \cdot e_u dR = \frac{1}{c^2} 4\pi d^2 \alpha e_u R^2$$

The efficiency  $\alpha$  at which surplus energy turns into elementary particles (mass), “Standard energy amount  $e_u$  per unit volume of the energy body  $\times$  surplus energy” is the energy difference per unit volume between space layers.

Therefore,  $\alpha \cdot e_u$  is the force applied to an object placed in the gravitational field.

So, let  $\alpha \cdot e_u = g$ .

Then M becomes:

$$\therefore M = \frac{1}{c^2} 4\pi d^2 g R^2$$

$$\therefore g = \frac{c^2}{4\pi d^2} \cdot \frac{M}{R^2}$$

#### **X24. Supplement 1; Growth**

The surplus energy changes into elementary particles under the pressure of the gravitational field.

Elementary particles eventually become bonded together by electromagnetic force. and create a molecular cloud.

The molecular cloud is attracted to the star's core, attaches to it, and becomes the material from which the core grows.

This process is repeated, and the star, gravitational field, and dark energy field grow.

#### **X24. Supplement 2; Cause of gravity**

Gravity is the result of the radial accumulation of energy differences within the inside and outside space layers.

Elementary particles (matter) in a gravitational field receive this energy difference and try to move inward where there is less energy. Then, the elementary particles (matter) compress the space and generate waves that become kinetic energy.

Every time elementary particles (matter) pass through the space layer, kinetic energy is added.

Elementary particles (matter) are dragged down by these waves.

If you want to move away from the star, you have to overcome an opposing energy difference.

### **X24. Supplement 3; Energy balance**

The accumulation of energy differences between each space layer is equal to the accumulation of surplus energy generated in the gravitational field. The surplus energy is used to grow the star.

And it is roughly as follows.

Star energy ( $mc^2$ )  $\cong$  Gravitational field energy ( $E$ )

The energy of the entire universe is as follows.

Stars mass + gravitational field energy + dark energy = 0

### **X 25. Appearance of photons and observation direction of light**

A photon is a wave that occurs in the space in front of an electron, and from which the kinetic energy that reflects the shape of the electron is separated.

Electrons that produce kinetic energy distort the electron's rotating and spreading wave with a distortion angle  $\theta$ .

Photons are also distorted with the distortion angle  $\theta$ .

This is important.

An observer observes the light from the side of photons.

The side of the photons reaches the observer with a delay of the distortion angle  $\theta$  from the time of photons emission.

As the foot of photons spreads as waves, the interior becomes thin.

The distance and the time delay caused from this distortion angle  $\theta$  is the speed of light.

The permittivity of vacuum is also this distortion angle.

It is the cause of Einstein's theory of relativity "the principle of constancy of the speed of light".

The relationship between the shape of photons, the speed of photons, and the speed

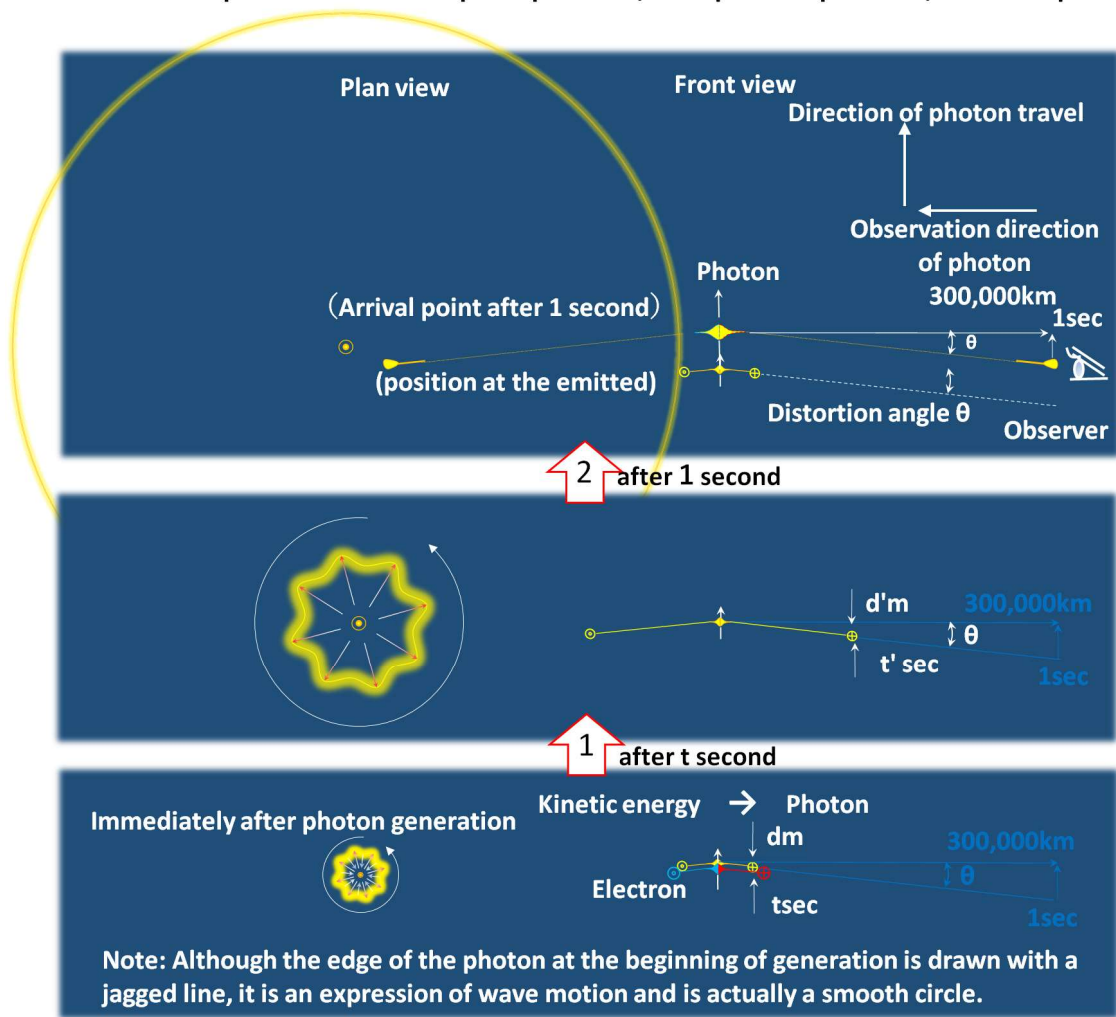


Fig.X25

### X26. Electronic transition and photon emission

The rotating waves of electrons and protons go in the same direction at the contact point, then work an attractive force.

The combined posture of both is shown in FigX.26-1,2. See FigX40 for details.

Upon excitation, electrons transit to the excited state orbital, after that transit to the ground state orbital.

The excitation energy creates a wave (kinetic energy) in the space, and that drags an electron.

When the electron stops in the ground state orbital, the wave just keeps going.

This kinetic energy is the photon.

Since electronic transitions occur repeatedly, photons are emitted continuously.

This photons form a plane wave and becomes light.

The wavelength of light is "Speed of photon  $\times$  Time until next transition".

### Speed of light and photon speed and wavelength

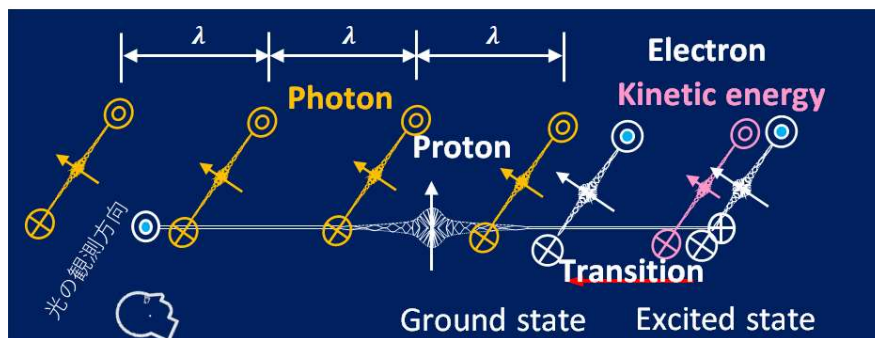


Fig.X26-1

Electronic transition, kinetic energy, and photon induced by distortion of rotating waves of electrons and protons

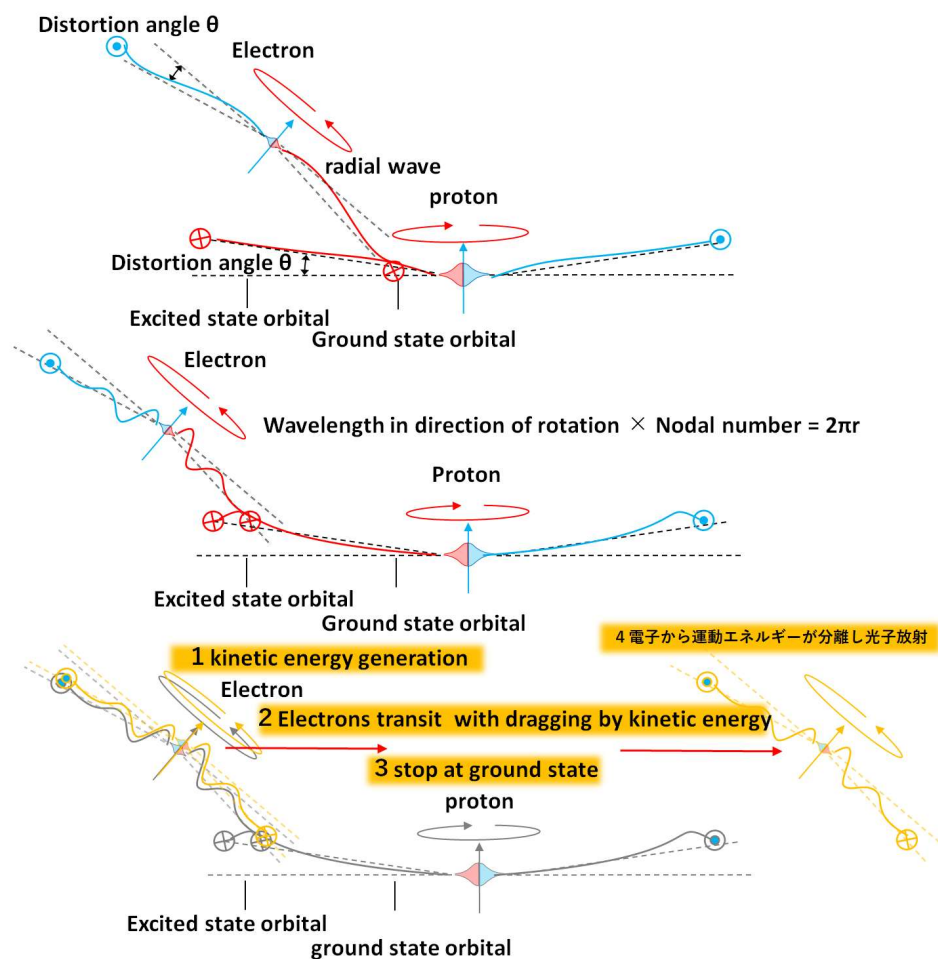


Fig.X26-2

### X27. Speed of light and speed of photons 1

The speed of light is "speed of light C".

It is constant regardless of the inertial frame.

This is known as the principle of constancy of the speed of light.

However, energy body theory has revealed that photons move at the "photon speed V."

In other words, we are observing the foot of photons moving perpendicular to the light source from the side.

By clarifying the difference between the "velocity of light C" and the "velocity of photons V," the nature of light and photons has been clarified.

This has made it possible to explain various phenomena such as the principle of the constant speed of light, the double slit experiment, and the Coulomb's constant etc.

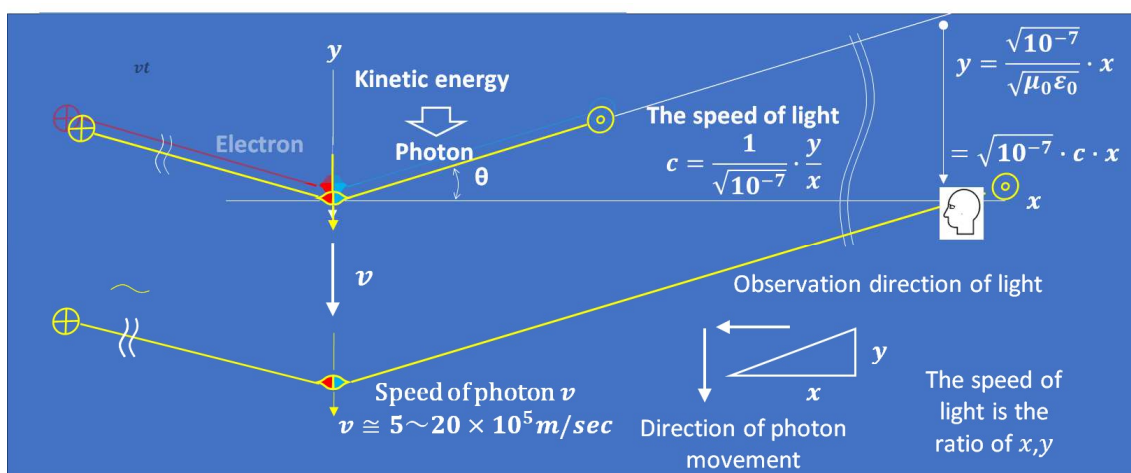


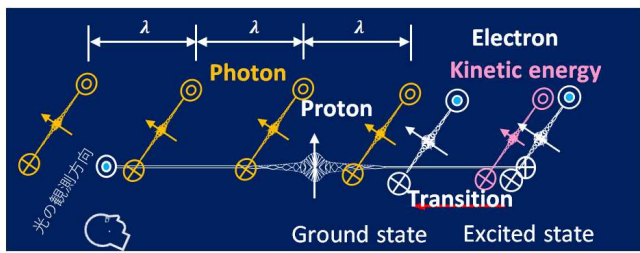
Fig.X27

### X28. Speed of light and speed of photons 2

"Speed of light C" is the rate of delay calculated by the angle of distortion of the photon's foot.

"Photon speed V" is the speed of photon movement.

Speed of light and photon speed and wavelength



$$f = k \frac{q_1 q_2}{r^2}$$

Actual measurement  
 $k = c^2 \times 10^{-7}$   
 "Definition"  
 $k = \frac{1}{4\pi\epsilon_0}$

Photon energy

$$K = \frac{1}{2}mv^2$$

Energy of electronic transition

$$E = hv = \hbar\omega$$

$$K = \frac{1}{2}mv^2 = E = hv = \hbar\omega$$



The speed of Photon  $v = \sqrt{\frac{2hv}{m}}$

separation



Electron energy

Rest energy of electron

Kinetic energy of electron  $K = \frac{1}{2}mv^2$

$$E = \sqrt{m^2c^4 + |P|^2c^2}$$

$$\cong mc^2 + \frac{mv^2}{2}$$

$$E_0 = mc^2$$

The speed of photon  $v$  is calculated separately from the speed of light  $C$ . The meaning is as shown below.

Restoration force of the foot of rotating electron waves and the speed of light

$$y = \sqrt{k}x = \frac{1}{\sqrt{4\pi\epsilon_0}} \cdot x = \frac{\sqrt{10^{-7}}}{\sqrt{4\pi \times 10^{-7} \cdot \epsilon_0}} \cdot x = \frac{\sqrt{10^{-7}}}{\sqrt{\mu_0\epsilon_0}} \cdot x = \sqrt{10^{-7}} \cdot c \cdot x$$

The speed of light  $\therefore c = \frac{1}{\sqrt{10^{-7}}} \cdot \frac{y}{x}$

Fig.X28

When an electron transits, the total energy possessed by the electron is expressed by the following equation (1) from the special theory of relativity.

$$E = E_0 + \frac{1}{2}mv^2 \quad (1)$$

$E$  : Total energy of electron

$E_0$  : Rest energy of electron

$E_k$  : Kinetic energy of electron

$m$  : Mass of electron

$v$  : Electron transition speed

The kinetic energy  $E_k$  of an electron when it transits is given by equation (2), which is obtained by subtracting the rest energy  $E_0$  of the electron from the equation (1) of the total energy  $E$  of the moving electron.



$$E_k = \frac{1}{2}mv^2 \quad (2)$$

The kinetic energy  $E_k$  of an electron when it transits is the same as the energy level difference  $|E_{n'} - E_n|$ .

$$E_k = |E_{n'} - E_n| \quad (3)$$

The kinetic energy  $E_k$  of an electron when it transits is the same as the energy and momentum  $E_p$  of the photon emitted from the electron. This is because the kinetic energy generated in front of the electron is a wave, and that wave separates from the electron and becomes a photon. In quantum theory, a photon is expressed as an elementary particle, a quantum state of all electromagnetic waves including light, and a force carrier of electromagnetic force. (Wikipedia photon).

$$E_k = E_p \quad (4)$$

Also, according to Planck's energy quantum hypothesis, the energy and momentum  $E_p$  of a photon are expressed by equations (5) and (6).

$$E_p = h\nu \quad (5)$$

$$c = \lambda\nu \quad \therefore E_p = \frac{ch}{\lambda} \quad (6)$$

$E_n$  : Energy level of quantum number n

$E_{n'}$  : Energy level of quantum number n'

$E_p$  : Photon energy and momentum

h : Planck constant

$\nu$  : Frequency of light

$\lambda$  : Wavelength of light

c : Speed of light

Since the electron's kinetic energy  $E$  (2) equation and the photon energy and momentum  $E_p$  (5) equation are equal, equation (7) is obtained.

$$E_k = \frac{1}{2}mv^2 = E_p = h\nu, \text{ or } = \frac{ch}{\lambda} \quad (7)$$

By transforming equation (7), we obtain the electron transition velocity  $v$  (8).



$$v = \sqrt{\frac{2h\nu}{m}} \quad (8)$$

By transforming Equation (7), the wavelength of light  $\lambda$  Equation (9) can be obtained.

$$\lambda = 2 \times \frac{ch}{mv^2} \quad (9)$$

The kinetic energy  $E_k$  of an electron was derived from the special theory of relativity, and the energy and momentum  $E_p$  of a photon were derived from Planck's energy quantum hypothesis. By mixing mathematical formulas that govern two seemingly different phenomena, they were able to derive the electron transition speed and the wavelength of light. It may seem strange, but the kinetic energy of an electron and a photon are actually the same thing. In other words, the photon moves at the electron transition speed  $v$  in equation (8). It was first clarified in the energy body theory and is called the "velocity of photons" to distinguish it from the "velocity of light."

### X29. Cause of light speed

A photon is a wave occurred in the space. It was a kinetic energy of an electron.

The photon inherits the distorted angle and inertial motion of the electron.

The distortion angle is constant.

The distortion angle is responsible for the Coulomb constant and the speed of light.

The restoring force of the electron distortion angle  $\theta$  is the Coulomb constant.

This is why the Coulomb constant includes the speed of light  $c$ .

Observation of light is to observe the side of a widening photon.

It arrives at the observer with a delay of the distortion angle from the radiation.

The ratio of this distance and time is the speed of light.

Since the distortion angle is constant, the speed of light is constant.

This is the cause of the "principle of constancy of the speed of light" in the theory of relativity.

The Planck constant is also in this ratio.

Relationship between the speed of light, the permittivity of vacuum  
(Coulomb's constant), and Planck's constant

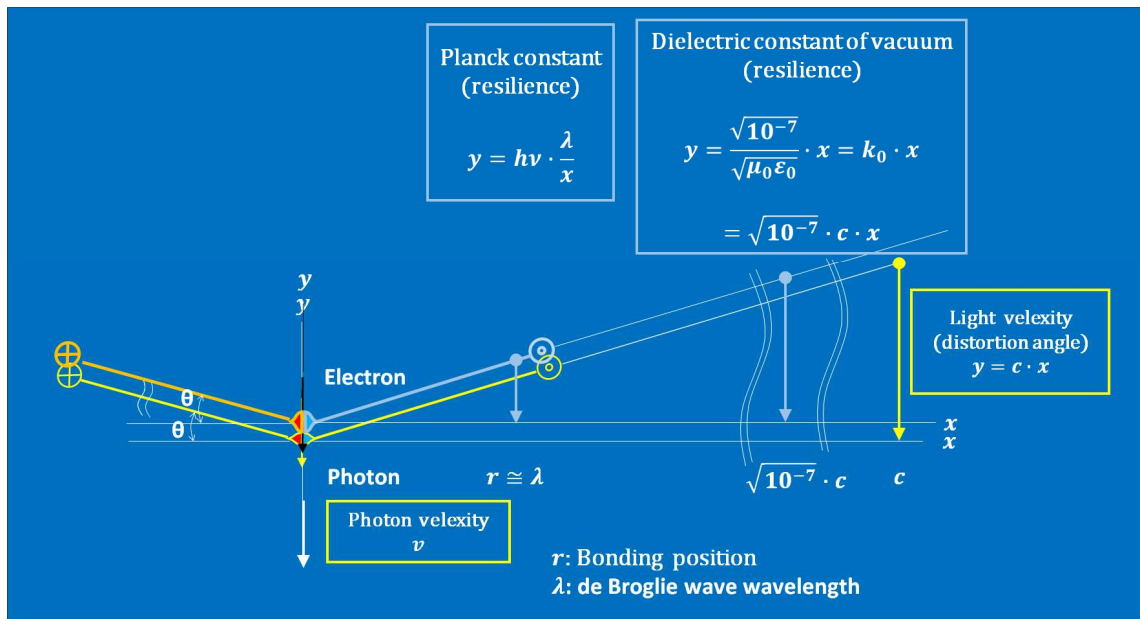


Fig.X29-1

**Restoring force, Coulomb constant, and Speed of light in the rotating electron waves spreaded**

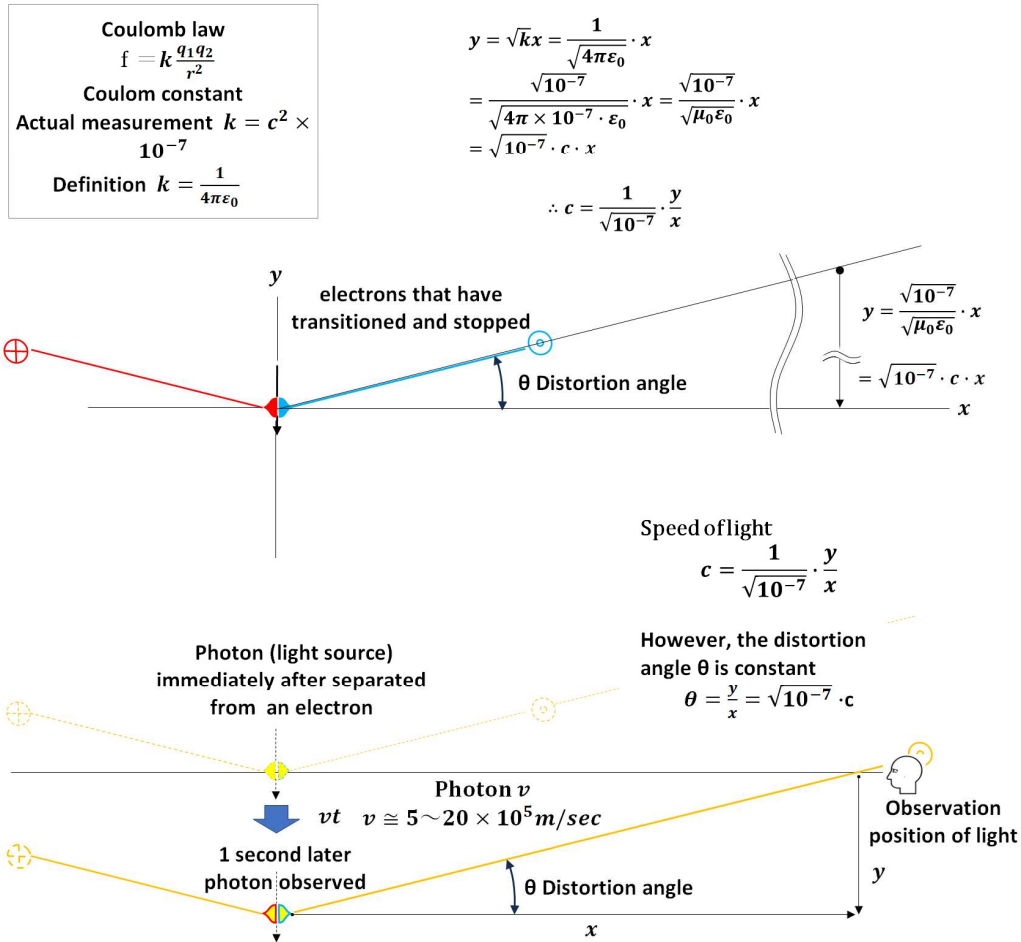


Fig.X29-2

**X30. Direction of photon travel**

The fundamental principle of the special theory of relativity, "the principle of the constant speed of light," is "The speed of light is a constant that has the same value no matter what inertial frame it is viewed from." However, I discovered the reason why this principle holds true.

The reason why the speed of light is the same  $c$  when seen from person A approaching the light source and from person B moving away from the light source is because the speed of light  $c$  is the ratio of the distance and time of the (constant) distortion angle at the foot of a photon.

The photon model of energy body theory has solved this mystery for the first time in 100 years.

The "principle of the constant speed of light" is based on three points: (1) a photon which foot expands, (2) a photon that moves in a direction perpendicular to the line connecting the light source and the observer, and (3) a distortion of the photon's foot that mirrors the distortion of the electron's base.

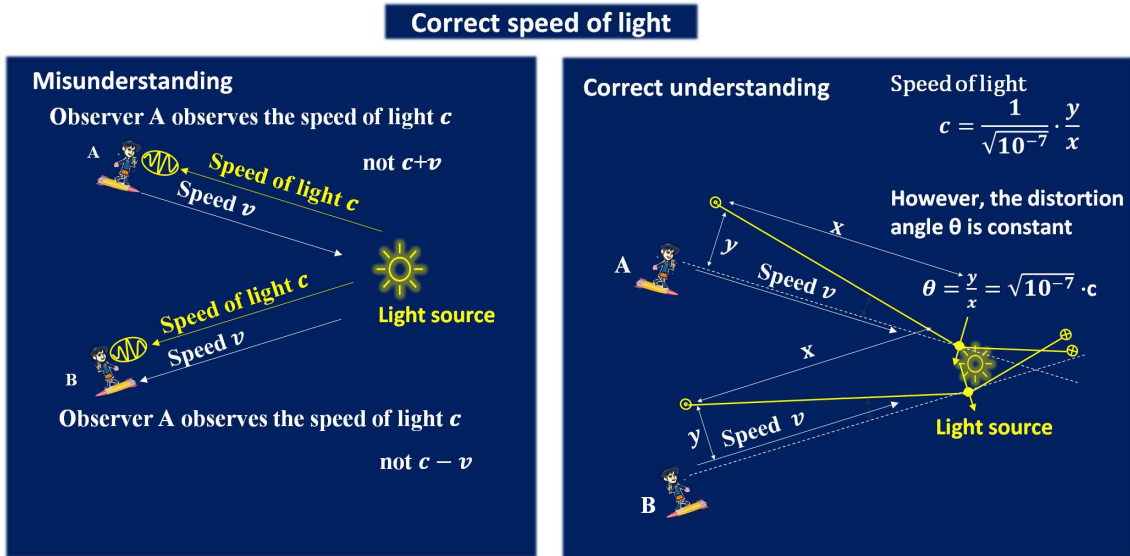


Fig.X30

### X31. Wavelength of light

Actually, it is not clear what the wavelength of light refers to. The wavelength of light is determined not by measuring the length of the wave using a ruler, but for example, by calculating the electronic transition energy and Planck's constant from  $E=h\nu=hc/\lambda$ .

However, this equation  $E=h\nu=hc/\lambda$  contains a mixture of "Velocity of light  $C$ " and "Velocity of a photon  $V$ ." In other words, the frequency  $\nu$  and wavelength  $\lambda$  should be determined by the "photon speed  $V$ ". Since the appearance of photons was made clear according to energy body theory, the wavelength of light is also clear.

A simple example of this is when photons are emitted due to electronic transitions.

For electronic transitions, emission line spectra are observed. This means that planar photons are emitted repeatedly to form plane waves. It can also be seen that the observed emission line spectrum is a side view of this.

From this, the wavelength  $\lambda$  of light as a plane wave is clearly determined.

Wavelength of light = "speed of photon x time until next transition"

In the case of electromagnetic waves, the wavelength is a completely different quantity

than in the case of emission line spectra.

In the case of alternating current, electrons rotate in the conductor to propagate electrical energy. Photons, which are the kinetic energy of electrons, are continuously emitted as the electrons rotate.

Therefore, the wavelength of electromagnetic waves is measured in one cycle determined by the rotation speed of the generator.

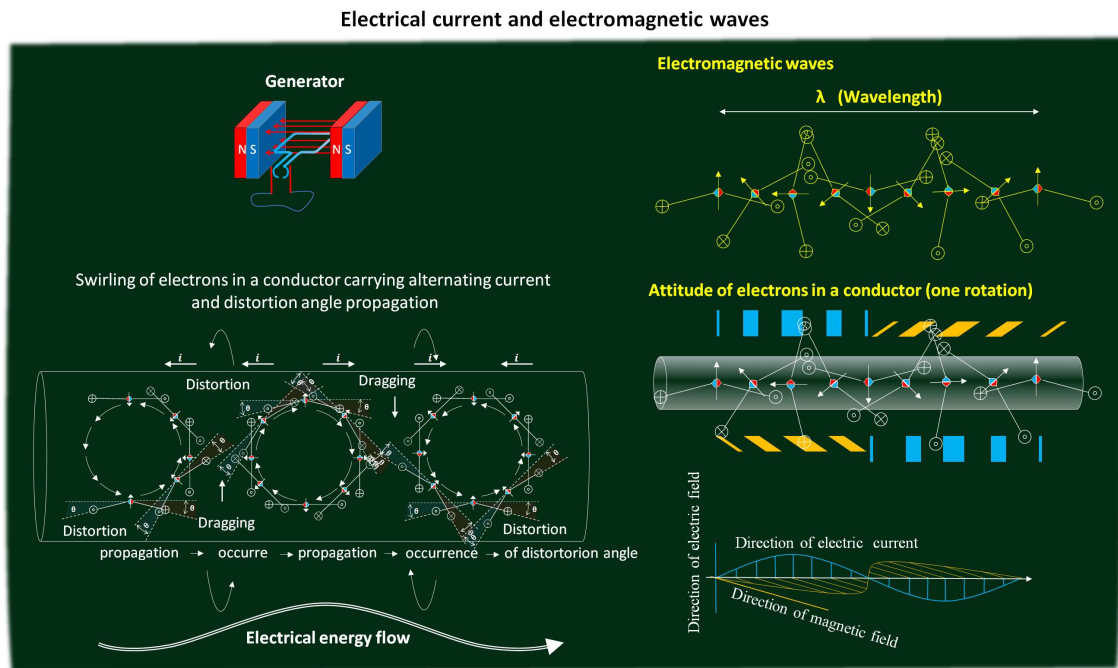


Fig.X31

### X32. Fermat's principle

"Light chooses the path that takes the shortest time." This is famous Fermat's principle.

However, it is an expression that can give someone a misunderstanding such as "Does light choose its path?"

Why that misunderstanding occur is because the appearance of photons is not properly understood.

If it is Expressed using the photon model of energy body theory,

"The foot of photons is refracted or reflected depending on the resistance (energy density) of the medium in the direction in which photons travel."

More generalized, it is as follows.

"Light changes the shape of photons so that the amount of energy used by photons remains constant."

**Fermat's principle (choose the path with the shortest time) and why**

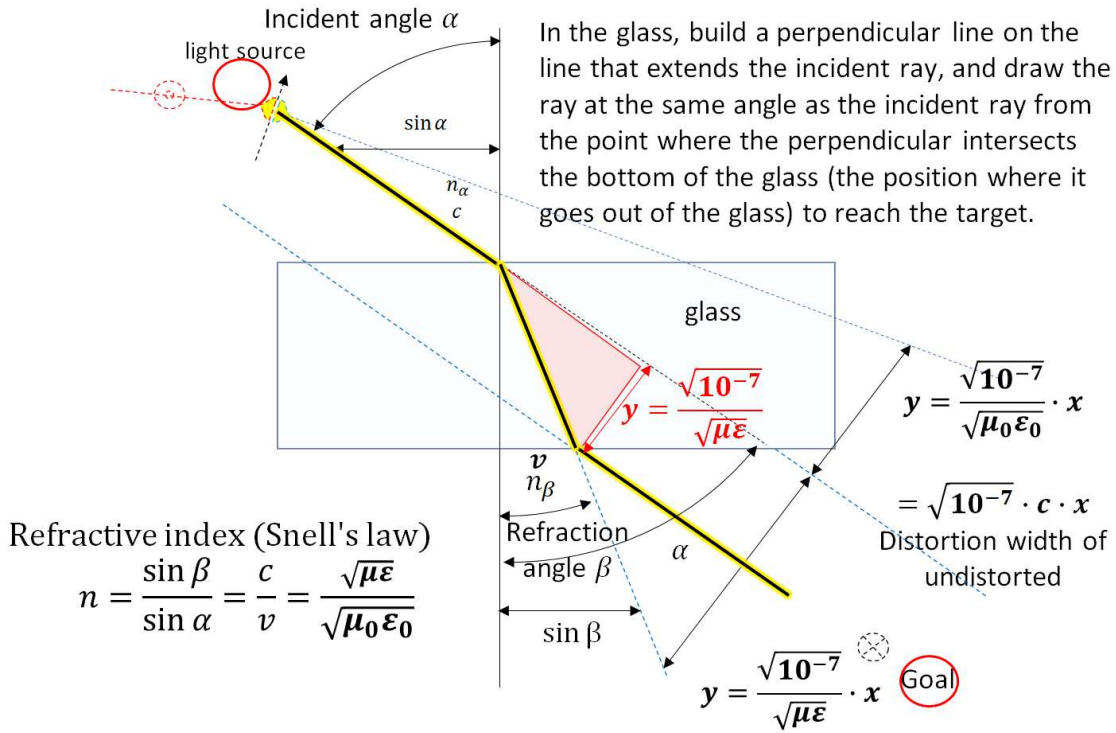


Fig.X32-1

The total energy of a photon is the same even if it passes through different medium.

$$(A + B) \cdot e_{\text{unit energy used in water}} = C \cdot e_{\text{unit energy used in air}}$$

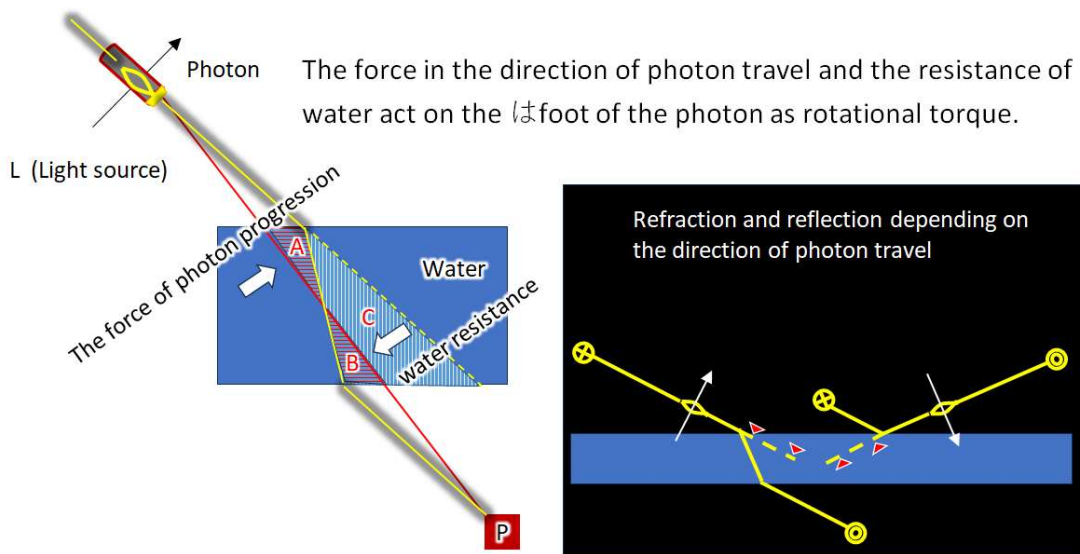


Fig.X32-2



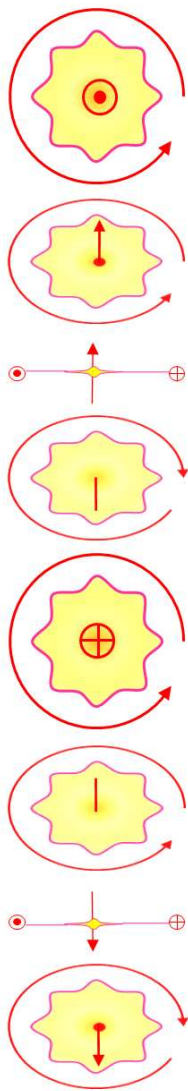
### X33. Brewster angle

The Brewster angle is the angle at which the reflectance of light is zero. In electromagnetism, it is derived using Maxwell's equations. But it is easily obtained using the energy body theory. As shown in Fig. X33, the P wave incident parallel to the plane of incidence consists of photon A heading toward the water surface and photon B heading toward the air from the water surface.

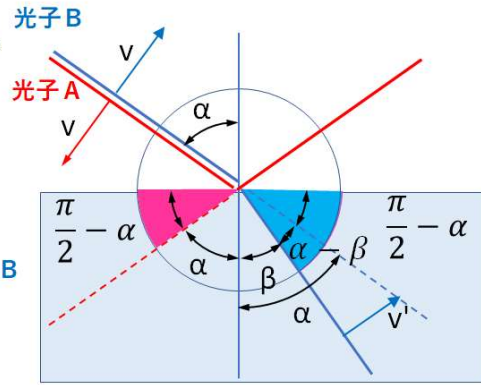
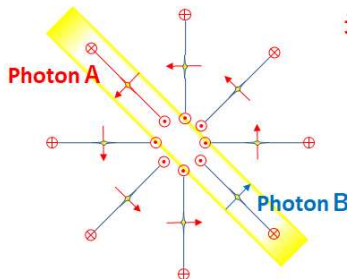
This figure shows the correctness of the photon model of the energy body theory.

### Huygens principle derived from the photon model of the energy body theory

Attitude and direction of S-wave photon



Attitude and direction of P-wave photon



There are two photons traveling in two different directions which enter water at an angle of incidence. Photon A travels from air to the incident surface of water at speed  $v$ , and photon B travels from water to the incident surface of water at speed  $v'$ . Photon A and photon B travel in opposite directions, so the energy given to water by photon A is in the red part, and the energy given to water by photon B is in the blue part. When photon A and photon B collide head-on, the energies in opposite directions are neutralized, resulting in less reflection. In particular, when the two collide directly in front head-on, the energy is completely neutralized and the reflectance becomes zero. This angle of incidence is called Brewster's angle. At Brewster's angle, the energy blue part  $(\alpha + \beta + \pi/2 - \alpha)$  given to water by photon A and the red part  $(\pi/2 - \alpha)$  given to water by photon B are the angle of reflection  $\alpha$  and the angle of refraction  $\beta$  equal.

$$\text{Blue} \left( \alpha - \beta + \frac{\pi}{2} - \alpha \right) + \text{Red} \left( \frac{\pi}{2} - \alpha \right) = \alpha + \beta$$

#### Reference

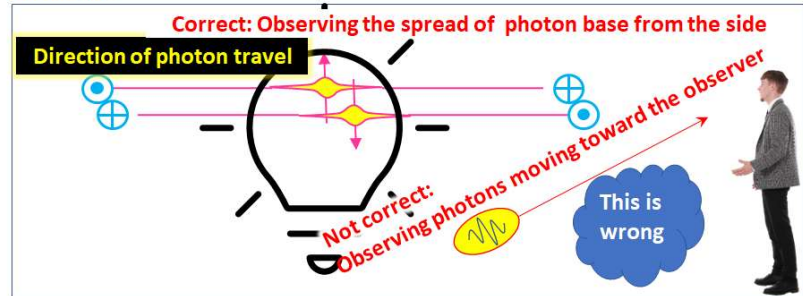


Fig.X33

### X34. Young's double slit experiment

Let's understand Young's double-slit experiment, a representative example of the mysteries of quantum, using a photon model with widening foot.

The figure above explains the reason why interference fringes appear even though photons pass through only one slit. This is because the photons travel in a direction perpendicular to the line connecting the light source and the screen, and the widening foot of the photons pass through the two slits simultaneously or nearly simultaneously.

The figure below explains why point-like interference fringes appear even when photons are emitted one by one.

This is because the photon moves toward the screen, and the particle part and widening foot of the photon passes through two slits at the same time.

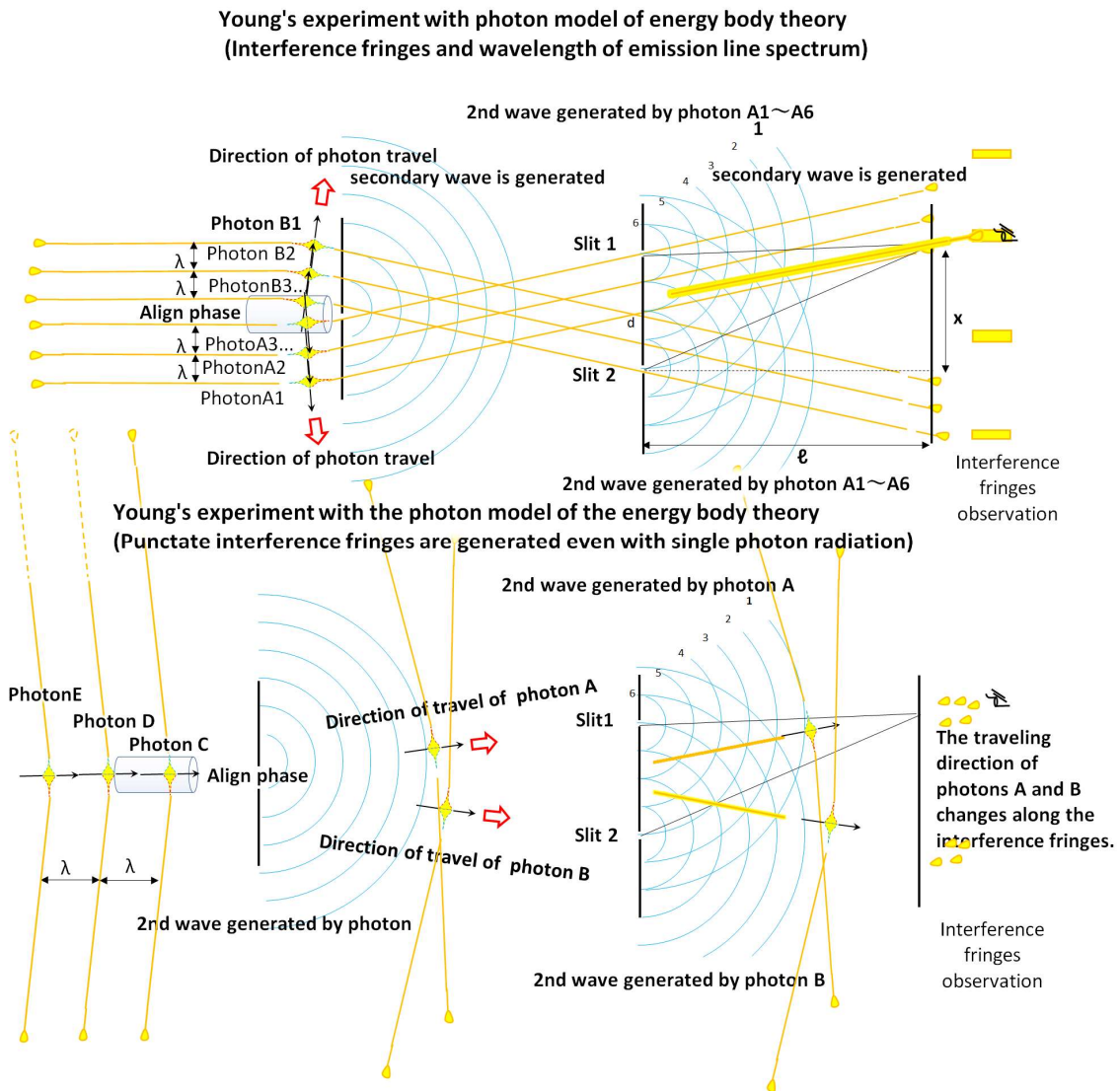


Fig.X34

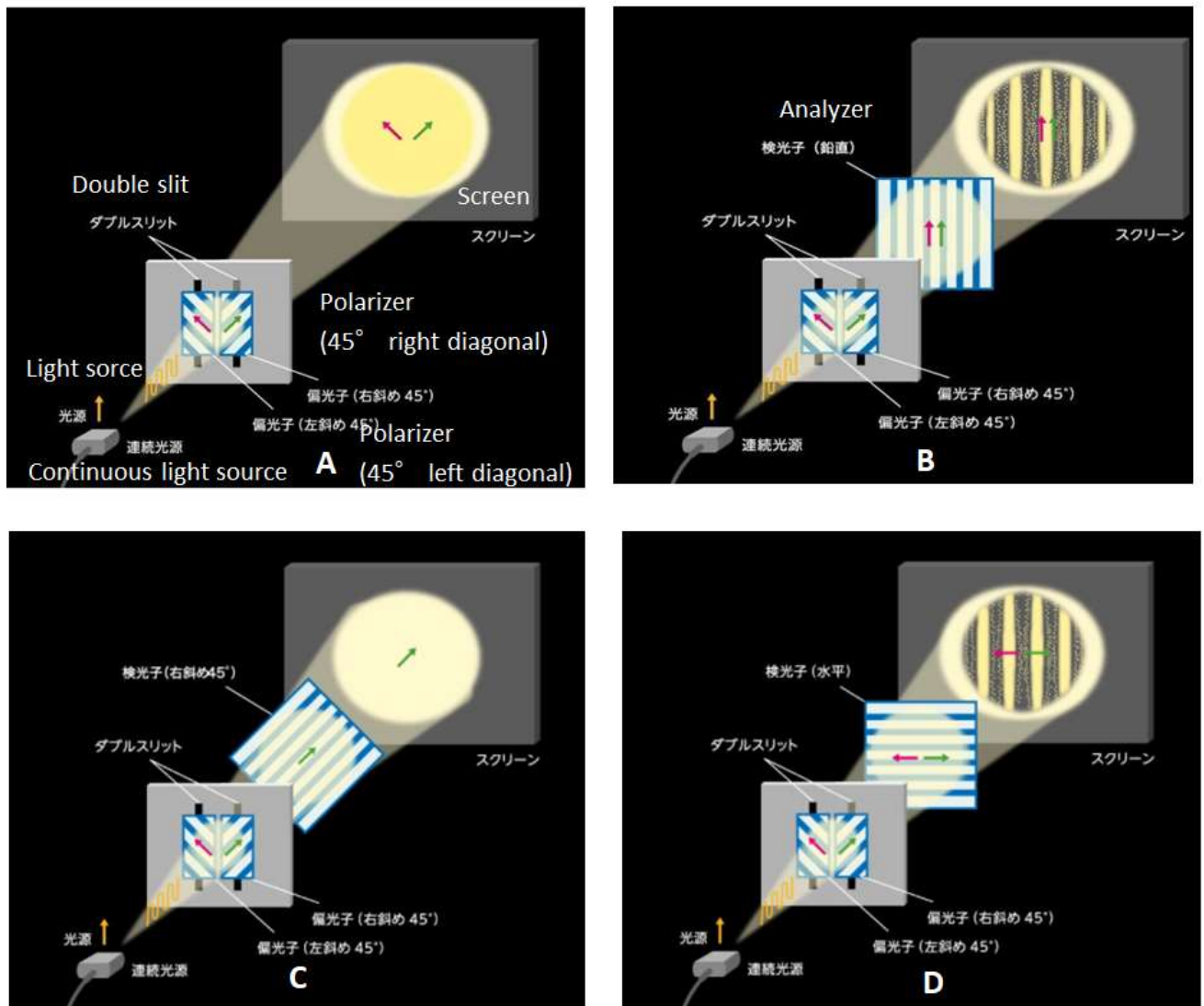
### X35. Fresnel-Arago polarization interference experiment

Experiments less minor than Young's double-slit experiment.

However, like a mysterious fairy, Fresnel Arago's polarization interference experiment invites us into a more mysterious world of light.

A single particle passed through both of the two orthogonal slits simultaneously, creating interference fringes.

### Fresnel-Arago polarization interference experiment



FigX35-1

Fig.X35-1 shows the Fresnel-Arago experimental system conducted by Hamamatsu

Photonics Co., Ltd. and published in "Photon Terrace."

In Young's single-photon interference experiment, also conducted by Hamamatsu.

Photonics Co., Ltd., interference fringes showing the nature of waves appeared when light passed through a double slit. In this experiment, even though the photon was just a single particle, it was able to pass through both slits at the same time, creating interference fringes that showed its wave nature.

In the Fresnel-Arago experimental system, unlike Young's interference experiment, a polarizer tilted  $45^\circ$  to the right and a polarizer tilted  $45^\circ$  to the left are attached to the double slit. Therefore, the obliquely polarized light that has passed through each slit becomes components orthogonal to each other. The pink and green arrows in the figure indicate the direction of polarized light.

- Figure A: Pink arrow and green arrow on the screen are perpendicular...No interference fringes appear.
- Figure B: Pink arrow and green arrow on the screen are parallel and in the same direction... Appearance of interference fringes
- Figure C: Only green arrows appear on the screen...No interference fringes appear.
- Figure D: The pink and green arrows are parallel and in opposite directions on the screen. • Appearance of interference fringes.
- The interference fringes in Figure B and the interference fringes in Figure D have reversed brightness and darkness.

The results of this experiment show that "light vibrates perpendicular to the direction of travel. And the vibrations have a direction."

### **Photon and device arrangement**

If the Fresnel-Arago experiment is replaced with the photon model of the energy body theory, the positional relationship will be as shown in Fig.X35-2. As mentioned in the explanation of Young's double-slit experiment, when an emission line spectrum appears on a screen, the photons are traveling in a direction perpendicular to the screen. If they appear as dots, the photons are traveling toward the screen. In the Fresnel-Arago experiment, the photons left dot-like marks on the screen, indicating that the photons were traveling perpendicular to the screen.

Fresnel-Arago polarization interference experiment  
Arrangement of photons and experimental equipment

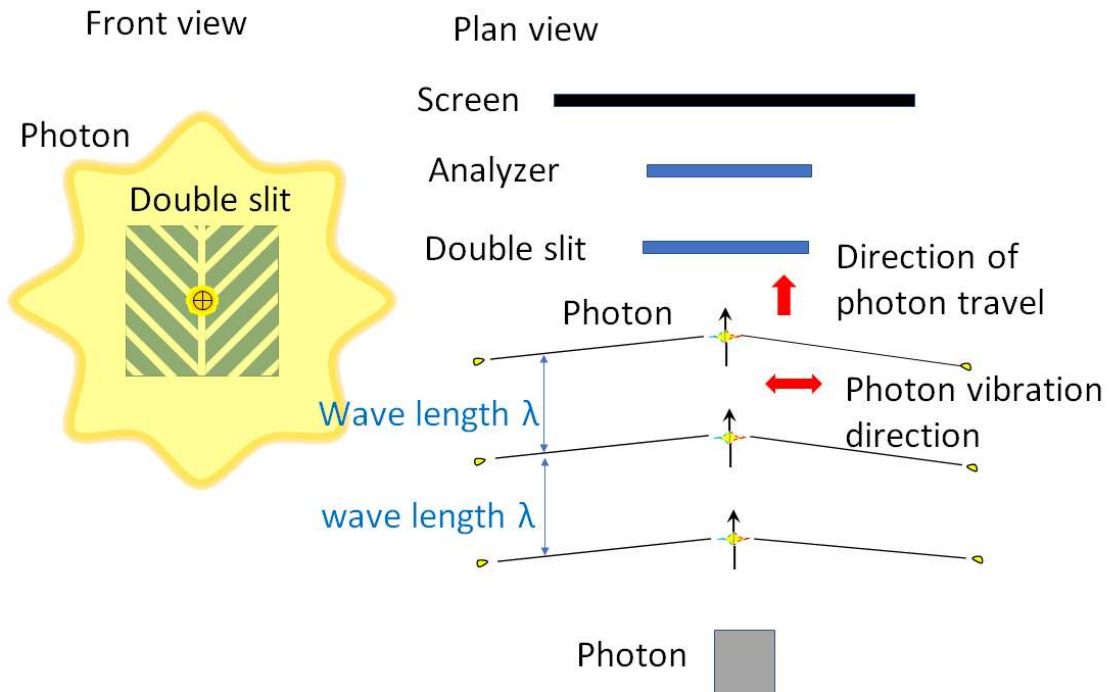


Fig.X35-2

The traveling direction of photons and the vibration direction of photons (the spreading plane) are perpendicular. Therefore, the spread plane of the photon directly collides with the slit of the polarizer. Then, the surface where the photon's spread is cut into a V-shaped slit, like a die cut. (Note: If the traveling direction of the photon is perpendicular to the screen, the diagonal polarization is not converted into vertical polarization.) The spread surface of the photon cut out in a V shape moves toward the analyzer. The slit of the analyzer can be vertical or horizontal. The foot of the photon, which has progressed to the V-shape, is once again cut out and becomes dotted. At this time, the V-shaped point-like photons are aligned in a straight line on the left and right sides of the V-shape. At that time, according to Huygens' principle, the second-order diffraction waves generated in the left and right spaces at V-shaped slit, producing interference fringes. Fig.X37-3 shows the origin and spacing of the diffracted waves. The point-shaped photons travel to the screen along the interference fringes generated in this space, forming interference fringes on the screen. Also, the brightness and darkness of the interference fringes are opposite between when the analyzer is placed vertically, and the interference fringes is placed horizontally. The reason for this is that the intervals (distances) of the diffracted waves generated in the slit are

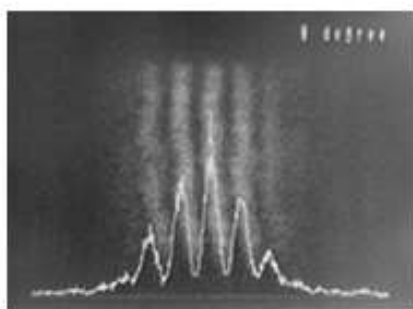


different.

### Reason for brightness reversal of interference fringes

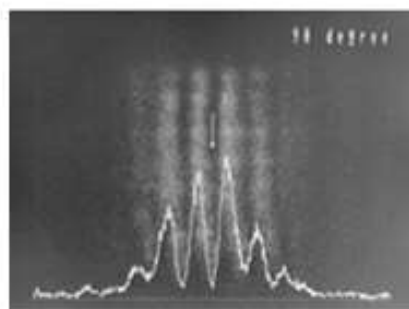
As shown in Fig.X35-4, the interval between interference fringes created by photons passing through a horizontal analyzer is  $\sqrt{2} \doteq 1.4$  times wider than the interval between interference fringes created by photons passing through a vertical analyzer. For this reason, the phase shifts and the brightness and darkness of the interference fringes are reversed.

## Interference fringes in the Fresnel-Arago experiment



図E-2 : 検光子が鉛直方向の場合、干渉縞が現れる

(Credit : Photon テラス)



図E-3 : 検光子が水平方向の場合、干渉縞が現れる (図E-2とは明暗が反転する)

(Credit : Photon テラス)

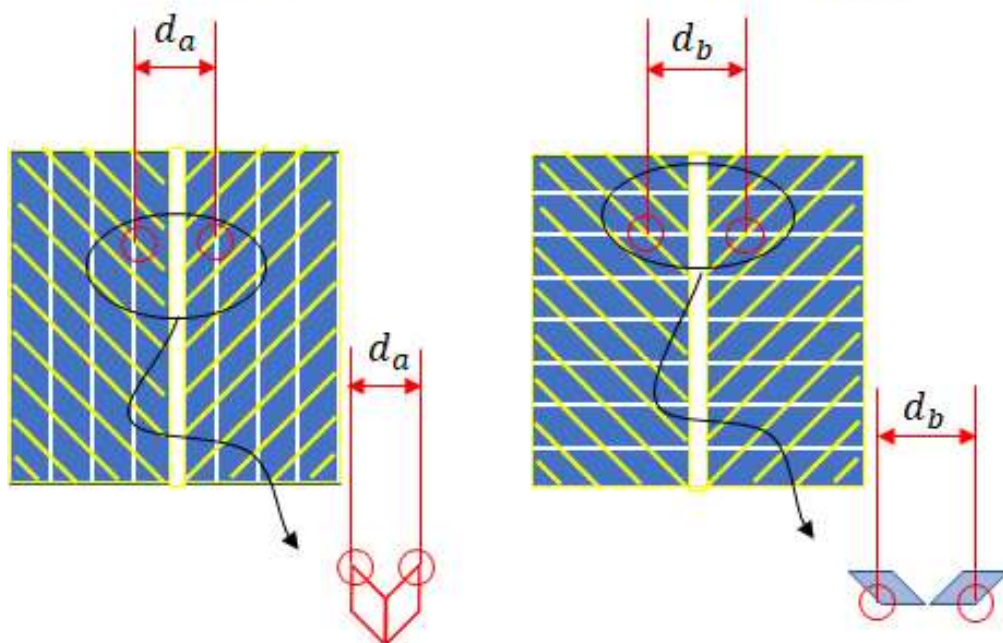


Fig.X35-3



Why are the brightness and darkness of the interference fringes reversed between vertical and horizontal analyzers?

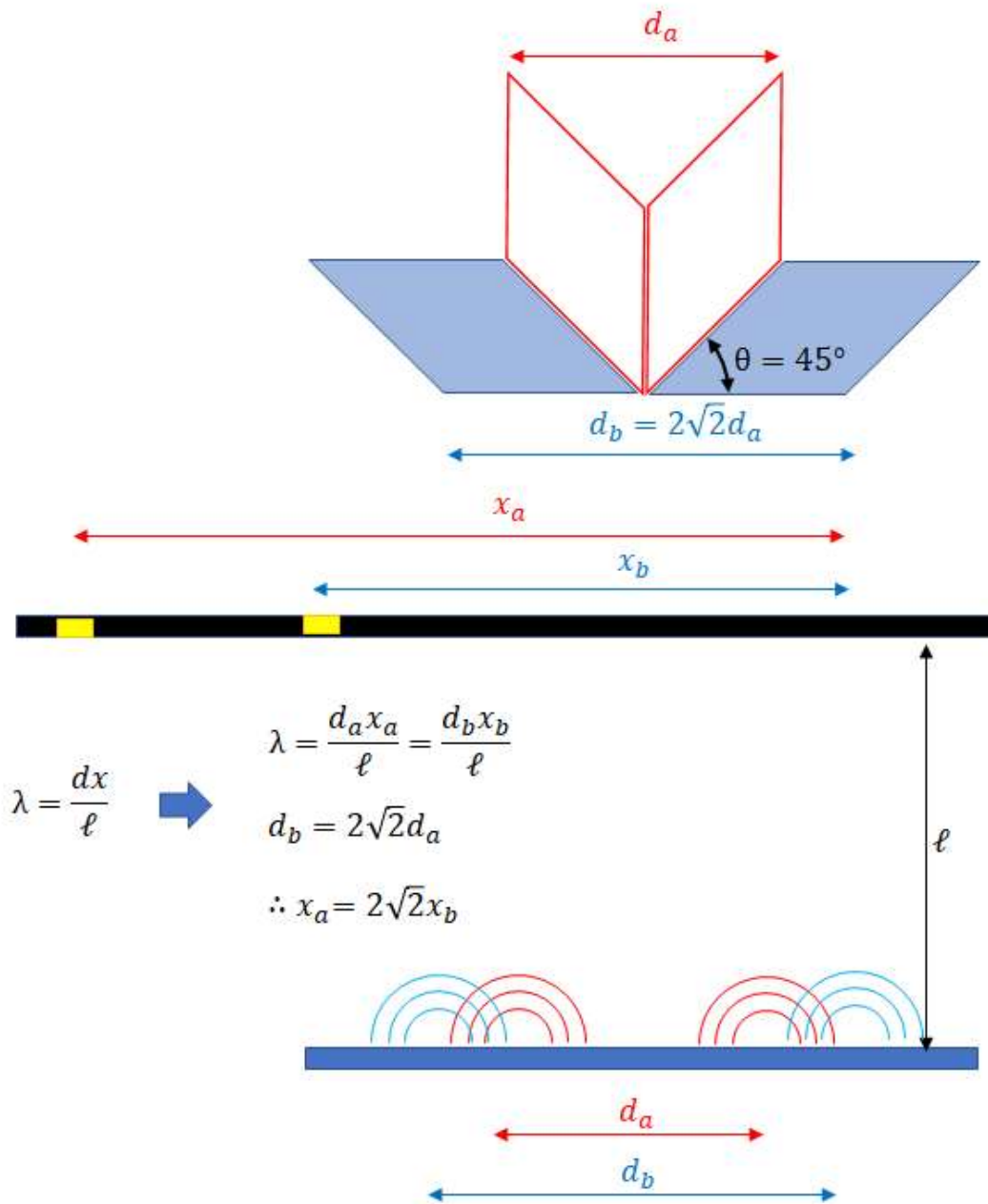


Fig.X35-4

**X36. Polarized photon**

When obliquely polarized photons are made incident on a polarizing beam splitter, they are sometimes transmitted and sometimes reflected. However, this outcome cannot be determined in advance and can only be predicted probabilistically. Also, the transmitted photons are converted into horizontal polarized photons or vertical polarizers.

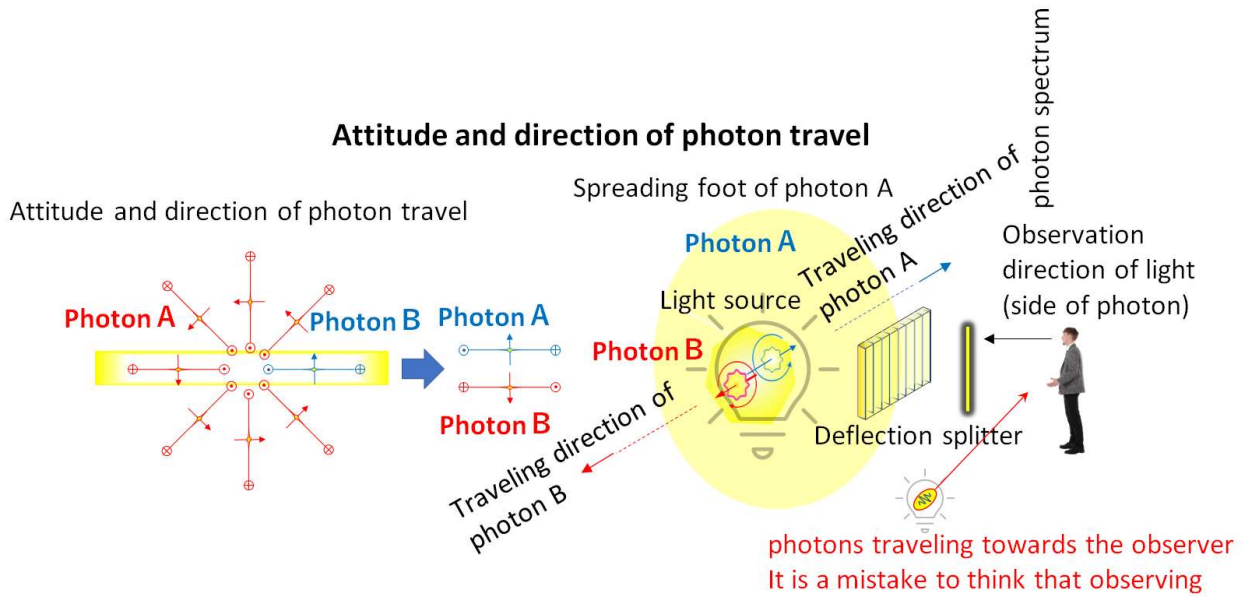


Fig.X36-1

It is particularly important to note that the polarized photons do not fly towards the polarization splitter. We sense light by observing from the side the spreading foot of photons moving in a direction perpendicular to the observer. Most researchers do not know this, so by understanding this better, mysteries will be solved like a fog being cleared. Fig.X36-3 depicts how the spreading foot of a photon gets caught in the groove of a polarizing beam splitter, and as the photon moves (2,900 km/sec), the spreading foot of the transmitted obliquely polarized photon is converted into vertically polarized light.

**The spreading foot of photons passing through the polarizing beam splitter  
(oblique deflection converted to vertical deflection)**

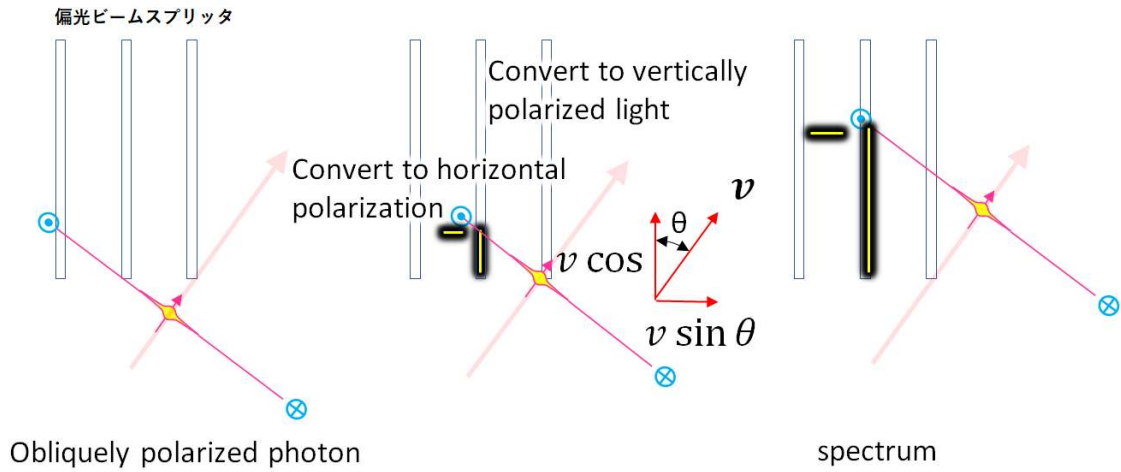


Fig.X36-2

**Obliquely polarized photon passes through beam splitter**

A Reflected photon piece is horizontally polarized

B The transmitted photon piece is vertically polarized

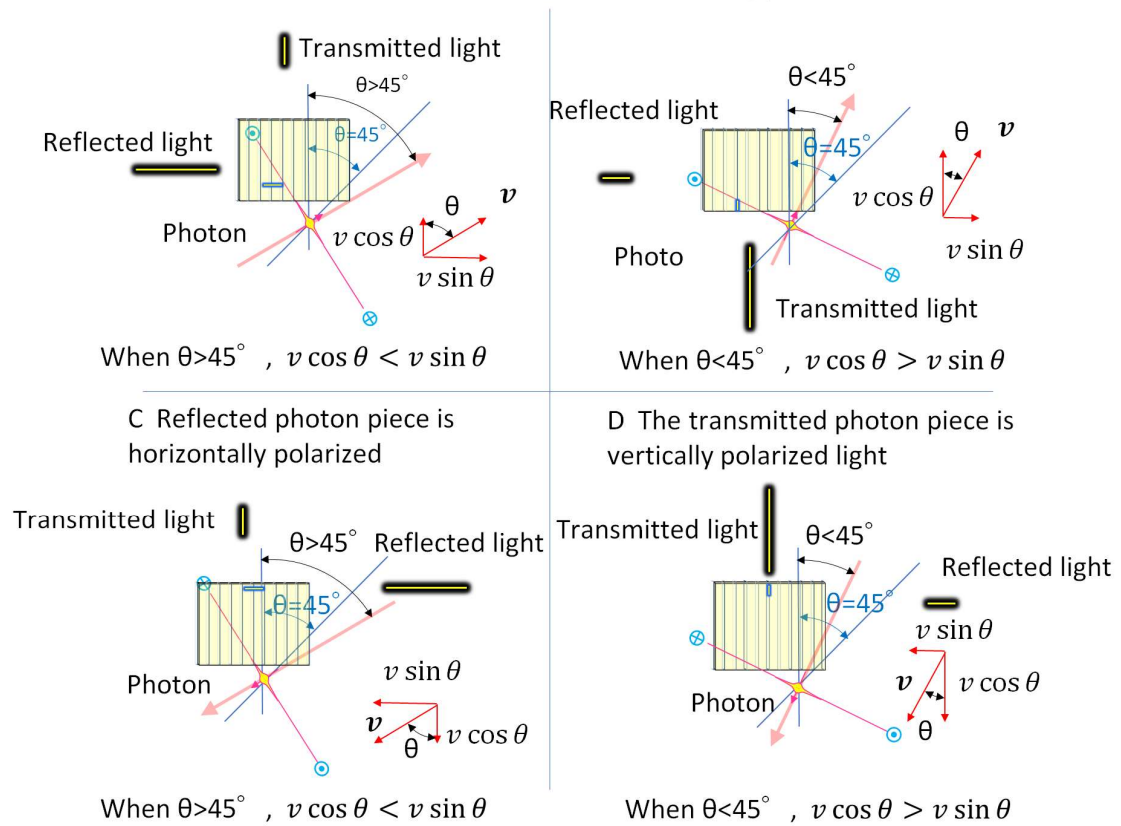


Fig.X36-3

Fig.X36-3 depicts how the spreading foot of an obliquely polarized photon is transmitted

and reflected as it traverses a beam splitter. When the incident angle of the photon is larger than 45 degrees, the horizontal motion ( $v \sin \theta$ ) becomes larger, resulting in horizontally polarized light. If the incident angle of the photon is smaller than 45 degrees, the vertical motion ( $v \cos \theta$ ) will be larger, resulting in vertically polarized light.  $v$  is the photon's velocity vector. Note that the beam splitter does not absorb light. Also, the photon's foot transmits or reflects only the first slit which the photon's foot touched.

The energy  $E$  of the photon is.

$$E = \frac{1}{2}mv^2 (= h\nu)$$

(Where,  $v$  is the speed of the photon,  $\nu$  is the frequency of light, and  $m$  is the mass of the electron)

Therefore, the energy  $E'$  of the transmitted light is  $E'$

$$\propto \frac{1}{2}m(v \cos \theta)^2 \text{ which is proportional to } \cos^2 \theta.$$

As a result, even for obliquely polarized photons, it is possible to predict whether they will be transmitted or reflected, and the same conclusion as for obliquely polarized photons can be obtained. And we escape from the mysteries of quantum. The reason for this is that photons with the lowest energy cannot be split according to quantum mechanics, but they can be split in the expansive photon model of energy body theory. Furthermore, although elementary particle theory considers photons to be a type of elementary particle, energy body theory believes that it is inappropriate to consider them as elementary particles. The reason is that elementary particles should be limited to those that can be accompanied by kinetic energy (so-called material particles). This is because photons are originally the kinetic energy of electrons, and it is more appropriate to think of them as waves. In quantum mechanics, the reason that photons are the smallest unit of energy and cannot be divided may be due to the insistence on the concept of elementary particles. Since we accept that photons have the property of polarization, we must also accept that photons have a thin and expansive shape.

### X37. Doppler effect of light

The Doppler effect of light has a transverse Doppler effect that is different from the Doppler effect of sound.

It can be seen from the figure that the photon model of the energy body theory has vertical and horizontal Doppler effects.

#### X37.1. Vertical Doppler effect S-system coordinate axis

Fig.X37-1 is a diagram in which the coordinate system of a light source moving in the positive direction of the x-axis at speed  $v$  is observed by an observer in the same coordinate system. A photon is emitted from the light source in the negative direction of the y-axis, independent of their velocity  $v$ . This speed is the "photon speed"  $V$ . When the photon's spreading foot reaches a distance of  $ct_1$ , the photon's spreading foot reaches observer A and is observed as light. However, since the inertial frame of the light source is moving at a speed of  $v$ , the two movements are combined and the photon heads diagonally downward to the right. Then, while the photon moves  $vt_2$  in the x-axis direction, observer A also moves  $vt_2$  and is at A'. In the end, the distance and time it takes for the photon's spreading foot to be observed by an observer remains the same. The reason for this is that photon is separated from the kinetic energy of an electron, so of course a photon in a certain inertial frame has the same motion as in the inertial frame.

Vertical Doppler effect of light using photon model of energy body theory S system

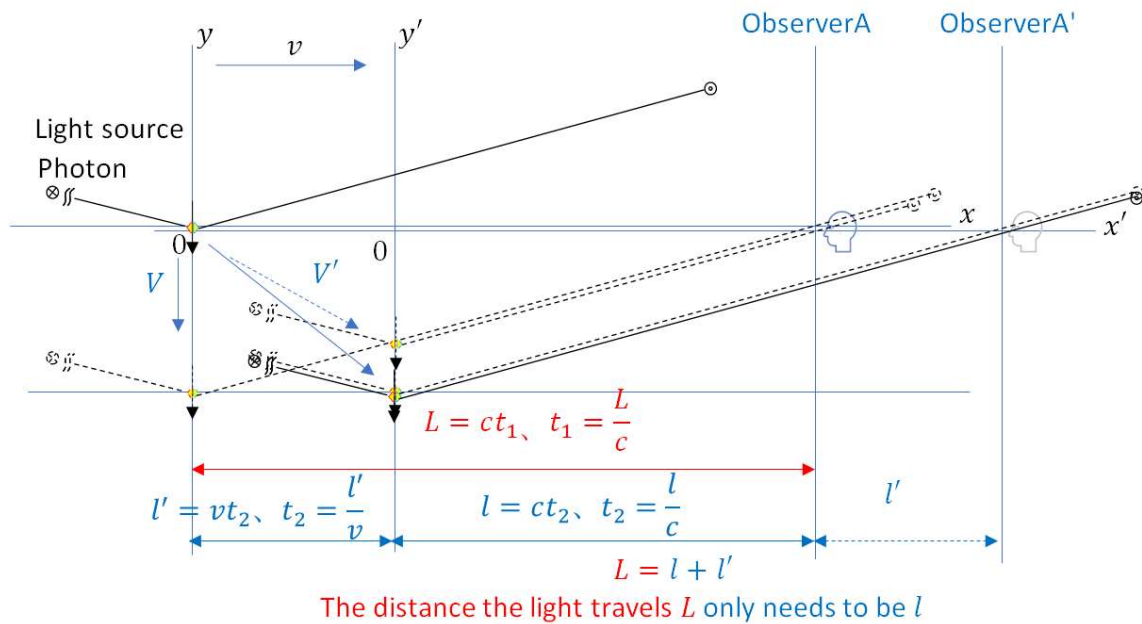


Fig.X37.1

$$L = l' + l = l + vt_2 = l + \frac{v}{c}l = \left(1 + \frac{v}{c}\right) \cdot l$$

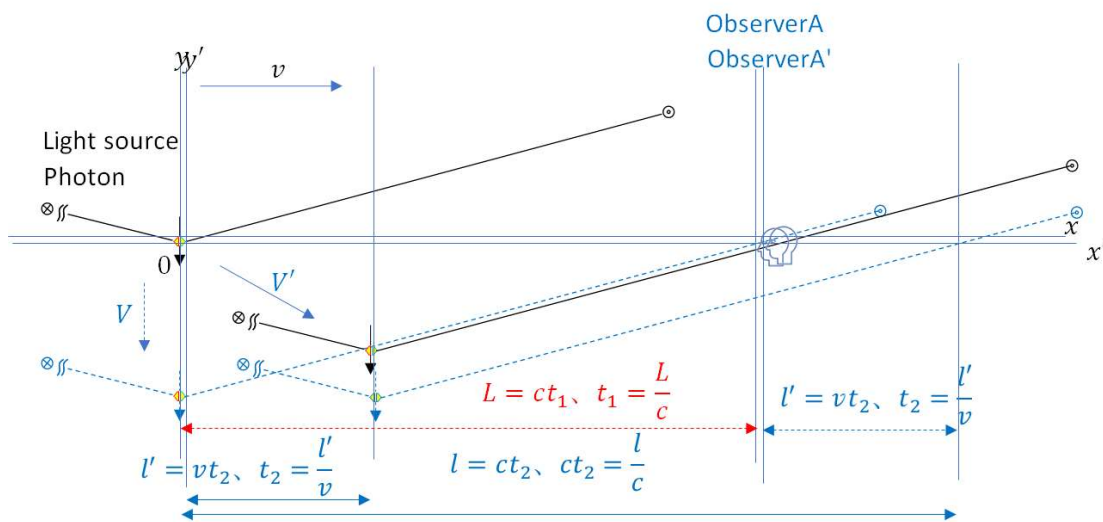
$$\because t_2 = \frac{l}{c}$$

$$\frac{L}{l} = 1 + \frac{v}{c} \quad (1)$$

### X37.2. Vertical Doppler effect S' system coordinate axis

Fig.X37-2 is a diagram of the coordinate system of a light source moving in the positive direction of the x-axis at speed  $v$ , as seen from another stationary inertial system. Photons are emitted from the light source in the negative direction of the y-axis, independent of their velocity  $v$ . This speed is the "photon speed"  $V$ . However, since the inertial frame of the light source is moving at a speed  $v$ , the two movements are combined, and the photon heads diagonally downward to the right at a speed  $V'$  and travels  $vt_2$  in the x-axis direction. At this time, the base of the photon travels a distance of  $ct_2$  on the x-axis, reaches observer A, and is observed as light. Since observer A is stationary, the light has traveled a short distance  $vt_2$ . Since the S system and the S' system are the same phenomenon, the time and length of the S system seen from the S' system are different according to the special theory of relativity.

Vertical Doppler effect of light based on photon model of energy body theory S' system



FigX37.2

$$L + l' = l = l - l' = l - vt_2 = \left(l - \frac{v}{c}l\right) = \left(1 - \frac{v}{c}\right) \cdot l$$



$$\because t_2 = \frac{l}{c}$$

$$\frac{L}{l} = 1 - \frac{v}{c} \quad (2)$$

Calculation of Doppler effect

$S$  系  $S$  type

$$\begin{aligned} L &= l' + l \\ &= l + vt_2 = l + \frac{v}{c}l = \left(1 + \frac{v}{c}\right) \cdot l \\ &\because t_2 = \frac{l}{c} \\ \frac{L}{l} &= 1 + \frac{v}{c} \quad (1) \end{aligned}$$

$S'$  系  $S'$  type

$$\begin{aligned} L + l' &= l \\ L = l - l' &= l - vt_2 = \left(l - \frac{v}{c}l\right) \\ &= \left(1 - \frac{v}{c}\right) \cdot l \\ &\because t_2 = \frac{l}{c} \\ \frac{L}{l} &= 1 - \frac{v}{c} \quad (2) \end{aligned}$$

Since it is the same phenomenon, multiplying both sides of (1) and (2), we get

$$\begin{aligned} \left(\frac{L}{l}\right)^2 &= \left(1 + \frac{v}{c}\right)\left(1 - \frac{v}{c}\right) \\ &= 1 - \left(\frac{v}{c}\right)^2 \\ \therefore \frac{L}{l} &= \sqrt{1 - \left(\frac{v}{c}\right)^2} \\ &\therefore \frac{L}{l} = \frac{1}{\gamma} \end{aligned}$$

Also, since,  $L = ct_1$ ,  $l = ct_2$

$$\frac{t_1}{t_2} = \frac{1}{\gamma}$$

When the light source approaches an observer

Here, if the light source approaches an observer,

$$\begin{aligned} L &= ct_1 \\ l &= ct_2 - vt_2 \\ &= (c - v)t_2 \end{aligned}$$

Therefore,

$$\begin{aligned} \frac{L}{l} &= \frac{c}{c - v} \cdot \frac{t_1}{t_2} \\ &= \frac{1}{1 - \frac{v}{c}} \cdot \frac{t_1}{t_2} \\ &= \frac{1}{\sqrt{1 - \frac{v}{c}} \cdot \sqrt{1 - \frac{v}{c}}} \cdot \frac{\sqrt{1 + \frac{v}{c}}}{\sqrt{1 + \frac{v}{c}}} \cdot \frac{t_1}{t_2} \\ &= \frac{\sqrt{1 + \frac{v}{c}}}{\sqrt{1 - \frac{v}{c}}} \cdot \frac{1}{\sqrt{1 - \left(\frac{v}{c}\right)^2}} \cdot \frac{t_1}{t_2} \\ &= \frac{\sqrt{1 + \frac{v}{c}}}{\sqrt{1 - \frac{v}{c}}} \cdot \gamma \cdot \frac{1}{\gamma} \\ &= \frac{\sqrt{1 + \frac{v}{c}}}{\sqrt{1 - \frac{v}{c}}} \end{aligned}$$

Here

$$\begin{aligned} L &= k\lambda_1 \quad , \quad l = k\lambda_2 \\ c &= v_1\lambda_1 \quad , \quad c = v_2\lambda_2 \end{aligned}$$

However, k is the wave number and  $\lambda$  is the wavelength.

$$\frac{\lambda_1}{\lambda_2} = \frac{v_2}{v_1}$$

$$\therefore \frac{L}{l} = \frac{\lambda_1}{\lambda_2} = \frac{v_2}{v_1} = \frac{\sqrt{1 + \frac{v}{c}}}{\sqrt{1 - \frac{v}{c}}}$$

**When the light source moves away from an observer**

Here, if the light source moves away from an observer,

$$\begin{aligned} L &= ct_1 \\ l &= ct_2 + vt_2 \\ &= (c + v)t_2 \end{aligned}$$

Therefore,

$$\begin{aligned} \frac{L}{l} &= \frac{c}{c + v} \cdot \frac{t_1}{t_2} \\ &= \frac{1}{1 + \frac{v}{c}} \cdot \frac{t_1}{t_2} \\ &= \frac{1}{\sqrt{1 + \frac{v}{c}} \cdot \sqrt{1 + \frac{v}{c}}} \cdot \frac{\sqrt{1 - \frac{v}{c}}}{\sqrt{1 - \frac{v}{c}}} \cdot \frac{t_1}{t_2} \\ &= \frac{\sqrt{1 - \frac{v}{c}}}{\sqrt{1 + \frac{v}{c}}} \cdot \frac{1}{\sqrt{1 - \left(\frac{v}{c}\right)^2}} \cdot \frac{t_1}{t_2} \\ &= \frac{\sqrt{1 - \frac{v}{c}}}{\sqrt{1 + \frac{v}{c}}} \cdot \gamma \cdot \frac{1}{\gamma} \\ &= \frac{\sqrt{1 - \frac{v}{c}}}{\sqrt{1 + \frac{v}{c}}} \end{aligned}$$

Here,

$$\begin{aligned} L &= k\lambda_1 \quad , \quad l = k\lambda_2 \\ c &= v_1\lambda_1 \quad , \quad c = v_2\lambda_2 \end{aligned}$$

However,  $k$  is the wave number and  $\lambda$  is the wavelength.

$$\begin{aligned} \frac{\lambda_1}{\lambda_2} &= \frac{v_2}{v_1} \\ \therefore \frac{L}{l} &= \frac{\lambda_1}{\lambda_2} = \frac{v_2}{v_1} = \frac{\sqrt{1 - \frac{v}{c}}}{\sqrt{1 + \frac{v}{c}}} \end{aligned}$$

### X37.3. Transverse Doppler effect S-system coordinate axis

FigX37-3 is a diagram in which the coordinate system of a light source moving in the negative direction of the  $y$ -axis at speed  $v$  is observed by an observer in the same coordinate system. A photon is emitted from the light source in the negative direction of the  $y$ -axis, independent of their velocity  $v$ . This speed is the "photon speed"  $V$ . However, the "velocity of the photon"  $V$  is omitted to avoid complication of calculations, since the result does not change even if it is omitted. When a photon moves  $ct_1$  in the  $y$ -axis direction, the photon's spreading foot travels a distance  $act_1$  in the  $x$ -axis direction, reaches observer A, and is observed as light. However, since the inertial frame of the light source is moving at a speed of  $v$ , while the photon moves  $vt_2$  in the  $y$ -axis direction, observer A also moves  $vt_2$  and is at A'. In the end, the distance and time it takes for the photon's spreading foot to be observed by an observer remains the same. The reason for this is that a photon is the kinetic energy separated from an electron, so of course a photon in a certain inertial frame has the same motion as in the inertial frame.

Transverse Doppler effect of light using photon model of energy body theory S system

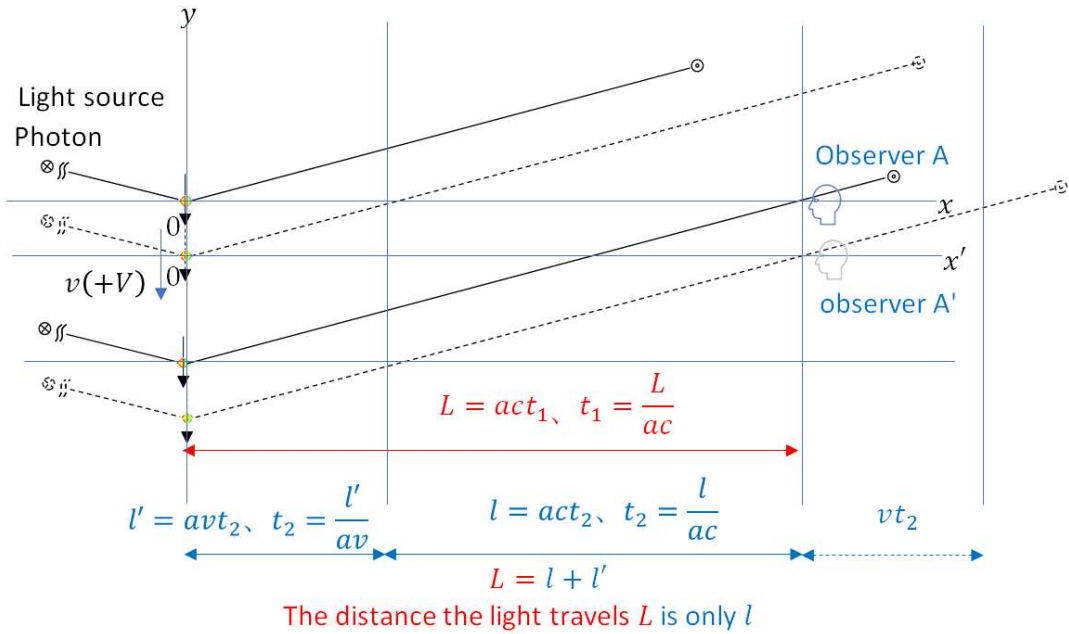


Fig.X37.3

$$\begin{aligned}
 L &= l' + l = l + avt_2 \\
 &= l \\
 + \frac{av}{ac}l &= \left(1 + \frac{av}{ac}\right) \cdot l \\
 \therefore t_2 &= \frac{l}{ac} \\
 \frac{L}{l} &= 1 + \frac{v}{c} \quad (1)
 \end{aligned}$$

$$\begin{aligned}
 y &= \sqrt{10^{-7}} \cdot c \cdot x \\
 x &= \frac{y}{\sqrt{10^{-7}} \cdot c} \\
 a &= \frac{1}{\sqrt{10^{-7}} \cdot c} \text{ とおくと} \\
 x &= ay
 \end{aligned}$$

Note that the speed of light is constant as follows:

$$c = \frac{1}{\sqrt{10^{-7}}} \cdot \frac{y}{x}$$

**37.4. Transverse Doppler effect S' system coordinate axis**

Ftg.X37-4 is a diagram in which the coordinate system of a light source moving in the negative direction of the y-axis at speed  $v$  is observed from another stationary inertial system. Photons are emitted from the light source in the negative direction of the y-axis, independent of their velocity  $v$ . This speed is the "photon speed"  $V$ . However, the "velocity of photons"  $V$  is omitted to avoid complication of calculations, since the result does not change even if it is omitted. When a photon moves  $ct_1$  in the y-axis direction, the

photon's tail travels a distance  $act_1$  in the x-axis direction, reaches observer A, and is observed as light. However, since the inertial frame of the light source is moving at a speed of  $v$ , while the photon travels  $vt_2$  in the y-axis direction, the base of the photon travels  $avt_2$  in the x-axis direction. Since the observer is stationary, the foot of the photon travels  $act_2$  in the x-axis direction until it reaches observer A and is observed as light. Since the S system and the S' system are the same phenomenon, the time and length of the S system seen from the S' system are different according to the special theory of relativity.

Transverse Doppler effect of light based on photon model of energy body theory S' system

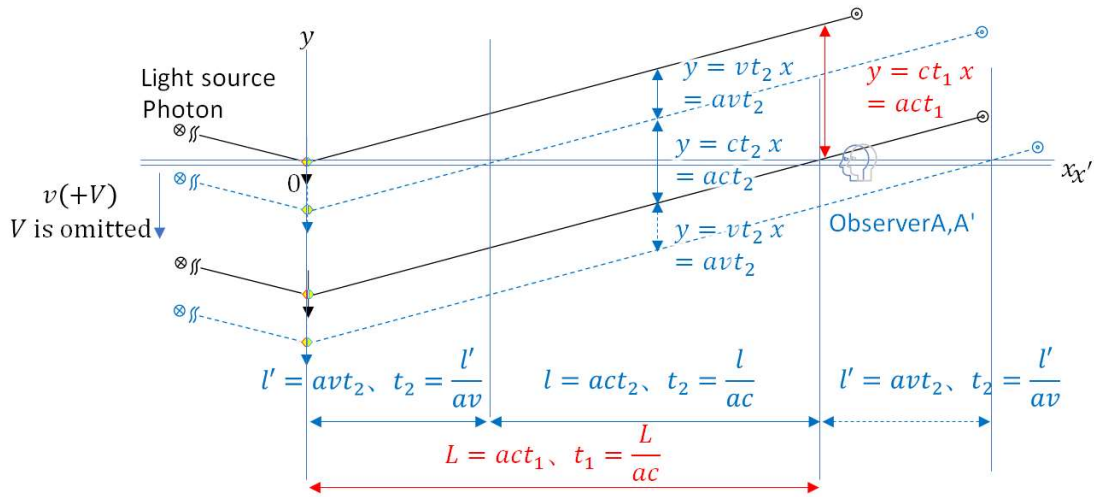


Fig.X37-4

$$y = \sqrt{10^{-7}} \cdot c \cdot x$$

$$x = \frac{y}{\sqrt{10^{-7}} \cdot c}$$

$$a = \frac{1}{\sqrt{10^{-7}} \cdot c} \text{ and then}$$

$$x = ay$$

$$L + l' = l$$

$$L = l - l' = l - avt_2$$

$$= \left( l - \frac{av}{ac} l \right) = \left( 1 - \frac{av}{ac} \right) \cdot l$$

$$\therefore t_2 = \frac{l}{ac}$$

Note that the speed of light is constant as follows:

$$\frac{L}{l} = 1 - \frac{v}{c} \quad (2)$$

$$c = \frac{1}{\sqrt{10^{-7}}} \cdot \frac{y}{x}$$

Calculation of Doppler effect

$$y = \sqrt{10^{-7}} \cdot c \cdot x$$



$$x = \frac{y}{\sqrt{10^{-7}} \cdot c}$$

$$a = \frac{1}{\sqrt{10^{-7}} \cdot c} \text{ and then}$$

$$x = ay$$

In addition, the speed of light is constant as

$$c = \frac{1}{\sqrt{10^{-7}}} \cdot \frac{y}{x}$$

S type

$$L = l' + l = l + avt_2 = l + \frac{av}{ac}l = \left(1 + \frac{av}{ac}\right) \cdot l$$

$$\therefore t_2 = \frac{l}{ac}$$

$$\frac{L}{l} = 1 + \frac{v}{c} \quad (1)$$

S' type

$$L + l' = l = l - l' = l - avt_2 = \left(l - \frac{av}{ac}l\right) = \left(1 - \frac{av}{ac}\right) \cdot l$$

$$\therefore t_2 = \frac{l}{ac}$$

$$\frac{L}{l} = 1 - \frac{v}{c} \quad (2)$$

The direction of movement of photons emitted from the light source is the y-axis direction, but the distance traveled by the light can be converted to the distance along the x-axis by  $y = \sqrt{10^{-7}cx}$ . Even if the calculation is performed directly in the y-axis direction, the same result will be obtained.

Since it is the same phenomenon, multiplying both sides of (1) and (2), we get

$$\begin{aligned}
\left(\frac{L}{l}\right)^2 &= \left(1 + \frac{v}{c}\right)\left(1 - \frac{v}{c}\right) \\
&= 1 - \left(\frac{v}{c}\right)^2 \\
\therefore \frac{L}{l} &= \sqrt{1 - \left(\frac{v}{c}\right)^2} \\
\therefore \frac{L}{l} &= \frac{1}{\gamma}
\end{aligned}$$

Here,  $L = k\lambda_1$ ,  $l = k\lambda_2$ ,  $c = v_1\lambda_1$ ,  $c = v_2\lambda_2$

However,  $k$  is the wave number and  $\lambda$  is the wavelength.

$$\begin{aligned}
\therefore \frac{L}{l} = \frac{\lambda_1}{\lambda_2} = \frac{v_2}{v_1} = \frac{1}{\gamma} &= \sqrt{1 - \left(\frac{v}{c}\right)^2} \\
\therefore \frac{v_2}{v_1} &= \sqrt{1 - \left(\frac{v}{c}\right)^2}
\end{aligned}$$

### X38. Entangled photon pairs

Quantum entanglement, a mysterious phenomenon, is impossible, but it is a fact.

However, the photon model of energy body theory gives a cause for this.

It is no longer a strange phenomenon.

There are two ways to generate “quantum entangled photon pairs”.

1. Parametric down-conversion in a crystal with second-order optical nonlinearity
2. Electronic transition of divalent atoms such as calcium and mercury

Two pairs of electrons located on the left and right of the protons-orbits are transited almost simultaneously to generate two photons, and when observed from the left side and right side, an entangled state can be observed.

# Quantum entangled photon pair 1

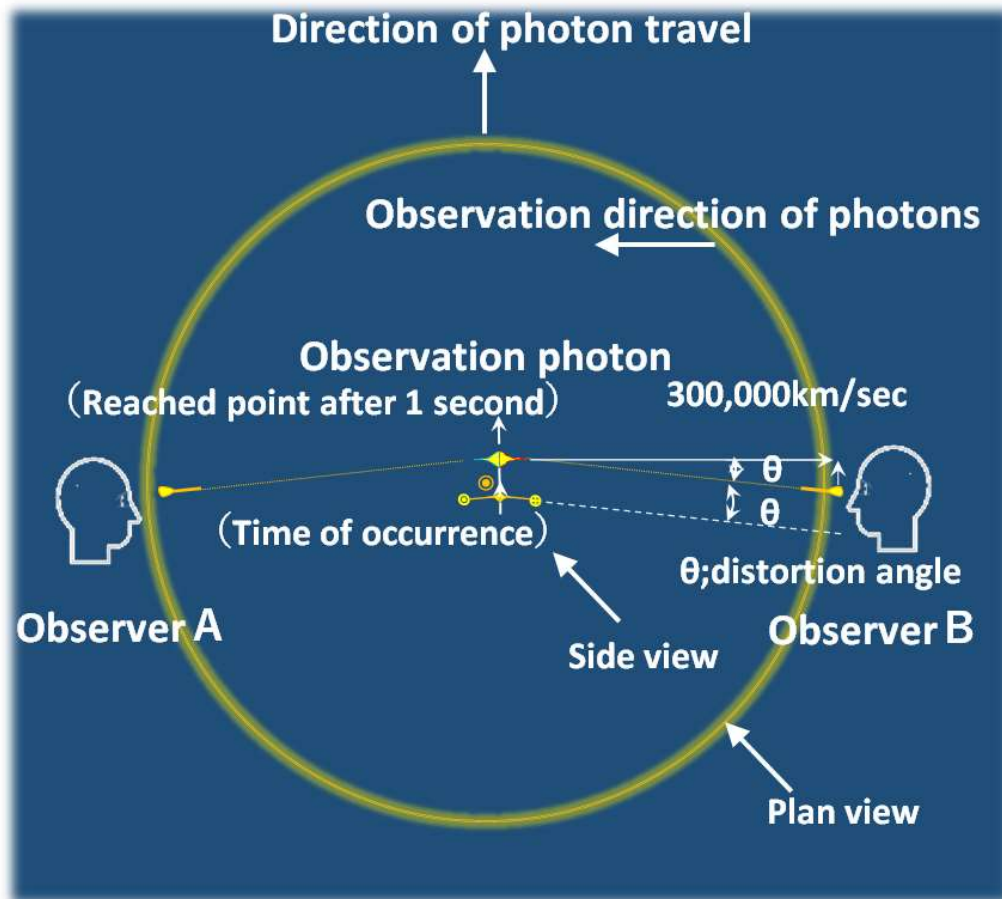
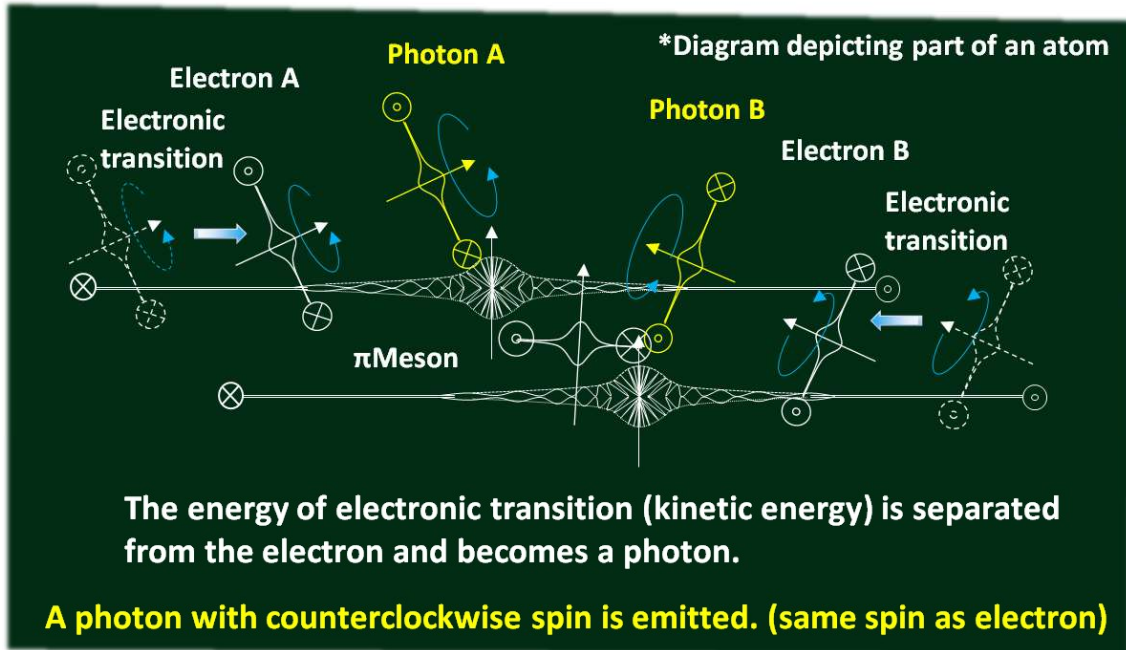


Fig.X38-1

## Quantum entangled photon pair 2



Excitation → Electronic transition → Base (stop)

**Kinetic energy → Photon**

The figure shows an example of a vertically polarized photon; when rotated 90 degrees, it becomes a horizontally polarized photon.

Fig.X38-2

### X39. Bell's inequality and Aspie's experiment

Within the scope of local realism, physical quantities in a certain correlation must satisfy Bell's inequality. However, since 1975, Aspe et al. have conducted a series of experiments and confirmed that Bell's inequality is violated. This broke the local realism advocated by Einstein and others.

However, in the photon model of the energy body theory, it can be foreseen that Bell's inequality is violated in advance.

Einstein's argument was revived.

Denial of the photon model of the energy body theory is necessary.

Fig.39-1 shows the experimental results of Aspie. It can be seen that the S value exceeds  $\pm 2$ , and Bell's inequality is violated. However, if you look closely at the diagram, the S value appears to be a sine wave. In other words, there is a certain regularity in the S value. To say

that there is a regularity means that there is a possibility that it can be predicted. This contradicts Bell's inequality. Bell's inequality is considered to be absolutely correct, but there may be something overlooked. When I considered this using the photon model of energy body theory, I found that it was possible to predict that Bell's inequality would be violated in advance. Bell's inequality needs modification.

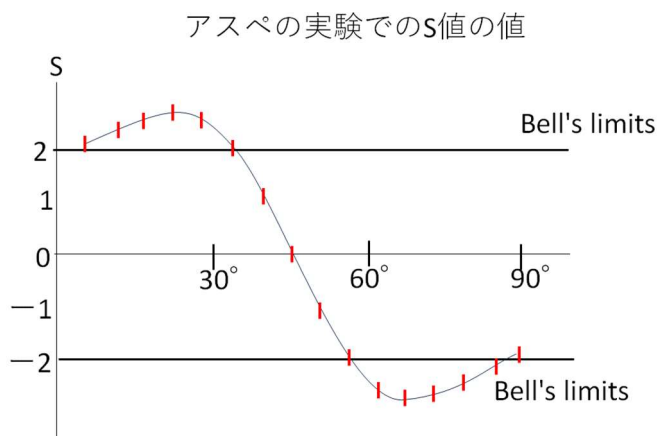


Fig.X39-1

Alain Aspect and his team conducted an experiment to confirm the CHSH inequality using a calcium cascade source. When a calcium atom is irradiated with a laser beam at a certain frequency and brought into a certain excited state, it emits two photons in opposite directions. Its internal state can be regarded as an entangled state (quantum entangled state) expressed by the following equation. This represents a superposition of the x and y polarization states of both photons.”

$$\frac{1}{\sqrt{2}}(|xx\rangle + |yy\rangle)$$

Before explaining the entanglement of twin photons using energy body theory, we would like to confirm the relationship between the traveling direction of photons and the position of the detection device etc. using Fig.X39-2 This is because the photon model of the energy body theory has a shape with a wide foot, and the direction in which the photon travels and the direction in which it is observed are very important. The photons are moving at right angles to the light source and the observer. Additionally, the spreading foot of photons causes polarization.

**Direction of photon travel and positional relationship of the device**

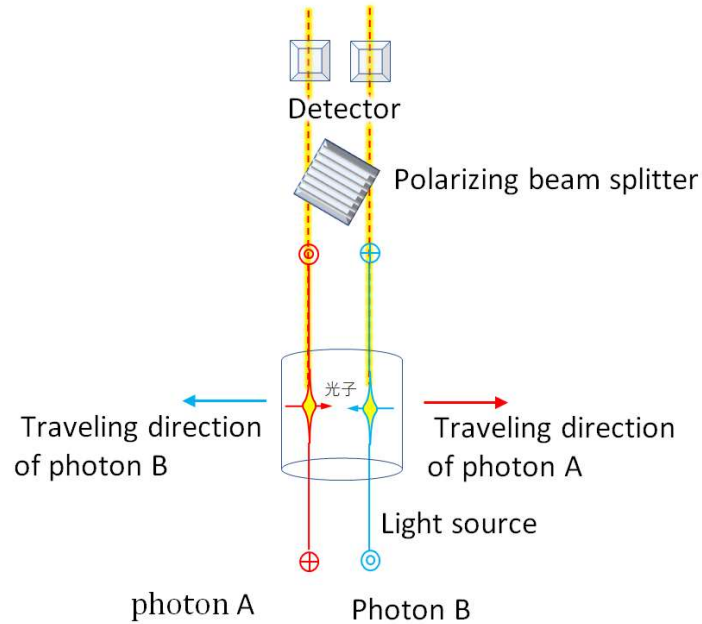


Fig.X39-2

FigX39-3 is drawn from the plane, front, and side so that the photons that pass through the obliquely polarized beam splitter can be viewed three-dimensionally. While the longitudinally polarized photon passes across the diagonally polarized beam splitter from left to right, a portion of the photon's foot passes through the slit of the diagonally polarized beam splitter. Therefore, the spreading foot of the transmitted vertically polarized photon becomes obliquely polarized. Moreover, the direction of its movement is opposite to that of the original photon. Therefore, rather than some of the longitudinally polarized photons being transmitted, it is considered that some of the longitudinally polarized photons are absorbed by the electrons in the polarizing beam splitter, and new photons are emitted.

**Photons passing through a polarizing beam splitter  
Converts vertically polarized light to obliquely polarized light**

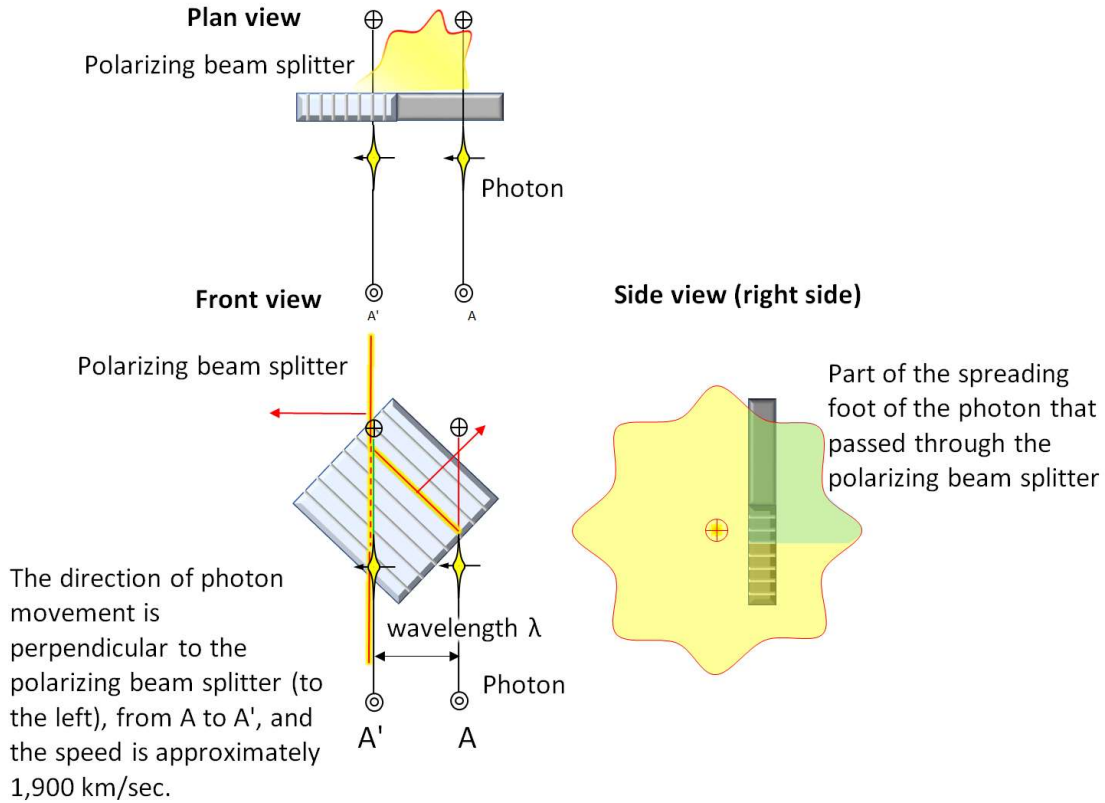


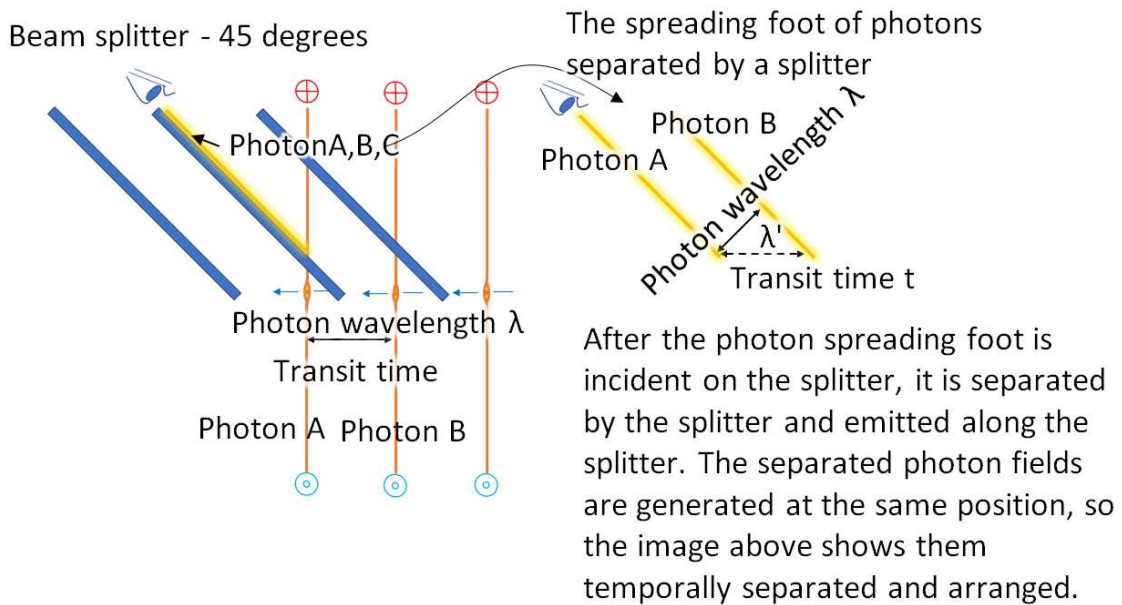
Fig.X39-3

Fig.X39-4 depicts the wavelength when a longitudinally polarized photon is converted to an obliquely polarized photon. Normally, as shown in the diagram on the left, the spreading plane of a photon is bent to maintain its integrity as a photon. Therefore, the wavelength of the obliquely polarized portion appears to be narrower than the wavelength of the vertically polarized portion. However, in reality, as shown in the figure on the right, the wavelength of the obliquely polarized portion remains the same as the wavelength of the vertically polarized portion. This is because light is a wave consisting of individual photons lined up at regular intervals.

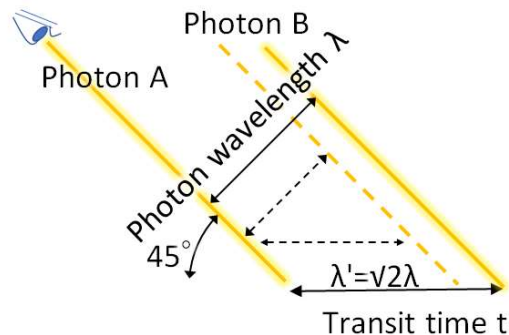
What is important here is that the wavelength width of obliquely polarized photons expands as shown by X in Fig.X39-4 when cut in the horizontal direction. This X becomes the detection range of photons. Therefore, if the vertically polarizing beam splitter is tilted to  $45^\circ$ , the photon detection range will be multiplied by  $\sqrt{2}$ .



## Aspie's experiment: Why the Bell inequality breaks



However, the spreading foot of photons separated in time do not look like the figure above, but like the figure below. Note that photons travel from right to left.



When the beam splitter is tilted 45 degrees, the observation range increases by  $\sqrt{2}$ . Therefore, exceeding the Bell inequality maximum of 2, photons will be discovered  $\sqrt{2}$  times more. This is the reason why the Bell inequality is violated.

Fig.X39-4

Fig.X39-5 shows the tilt of the beam splitter and the transmission of vertically polarized photons. The length of the wavelength of obliquely polarized light cut horizontally is the photon discovery range, and  $1/X$  of that length is the photon discovery probability  $U$ . Vertically polarized photons include photon A, which moves to the right or left, and photon B, which moves from the left. These two photons are entangled. The probability  $U$  of

finding a photon changes depending on the angle of incidence on the beam splitter.

- When the incident angle is acute, less than  $45^\circ$ , it is not transmitted. (Beam splitter angle  $45^\circ$  to  $90^\circ$  for photon A, beam splitter angle  $-45^\circ$  to  $-90^\circ$  for photon B)
- When the incident angle is obtuse  $45^\circ$  or more. (Beam splitter angle  $45^\circ$  to  $-90^\circ$  for photon A, beam splitter angle  $-45^\circ$  to  $-90^\circ$  for photon B) it is transmitted.

In other words, the two photons are.

For obtuse angles greater than  $45^\circ$ ,

-If photon A is transmitted, photon B is also transmitted.

-If photon A is not transmitted, photon B is also not.

For acute angles less than  $45^\circ$ ,

• When photon A is transmitted, photon B is not transmitted.

• When photon A is not transmitted, photon B is transmitted.

This results in a state of quantum entanglement.

### Beam splitter angle and photon discovery probability

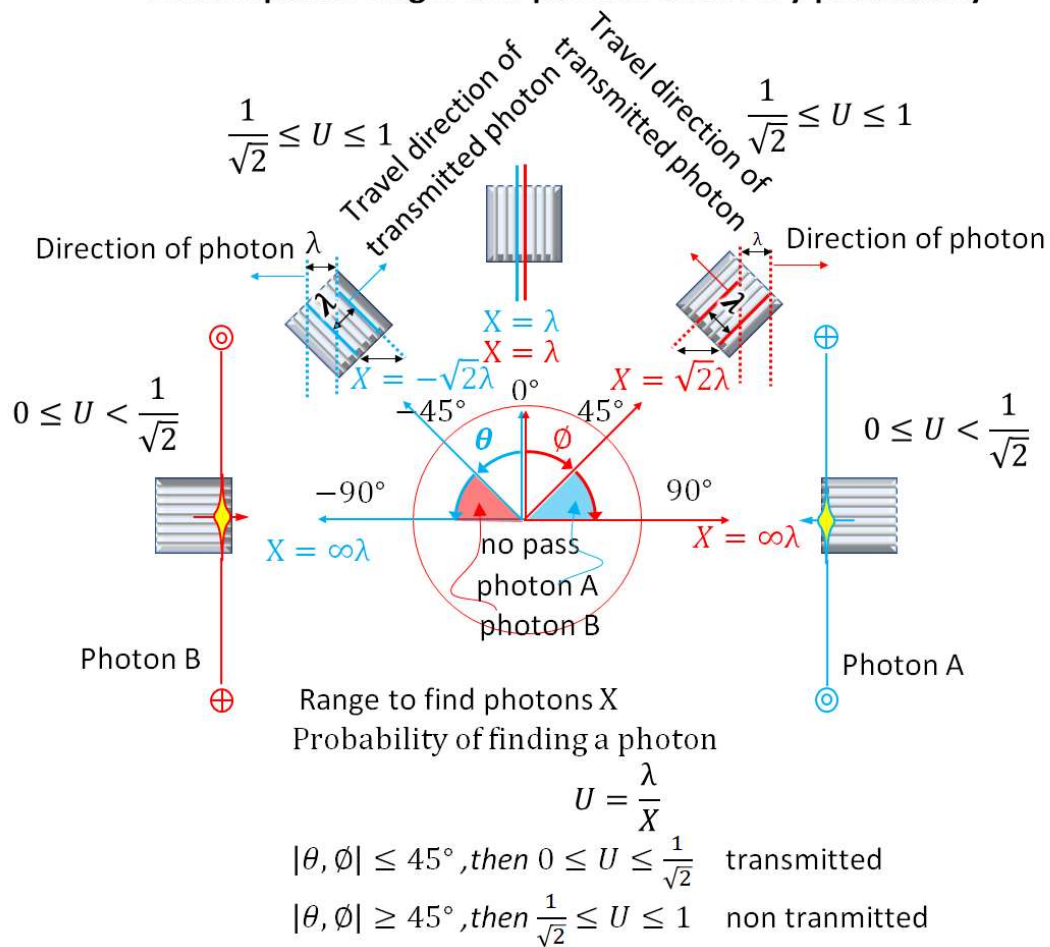


Fig.X39-5

Fig.X39-6 depicts the rate at which photon energy is divided into transmission and reflection depending on the photon incident on the beam splitter and the angle of the beam splitter. It can be seen that when the angle  $\theta$  between the photon spreading plane and the beam splitter is less than  $45^\circ$ , the transmitted energy  $E_t$  exceeds the reflected energy  $E_r$ , and the photon passes through the beam splitter. It can be seen that when  $\theta$  is  $45^\circ$  or more, the reflected energy  $E_r$  exceeds the transmitted energy  $E_t$ , and the photon does not pass through the beam splitter. The question is what happens when  $\theta$  is exactly  $45^\circ$ . Figure 10 depicts the twin photons traveling from right to left. Although  $\theta$  is the same  $45^\circ$ , the difference is that in the right figure, the photons are incident on the beam splitter at an acute angle, whereas in the left figure, they are incident at an obtuse angle. Considering the direction of the kinetic energy of the photon, it is natural to think that it will be transmitted if it is at an obtuse angle. On the other hand, although it is not shown in the figure, the other of the twin photons is traveling from left to right, so the result is the opposite. That is, if one of the twin photons is transmitted, the other is not transmitted.

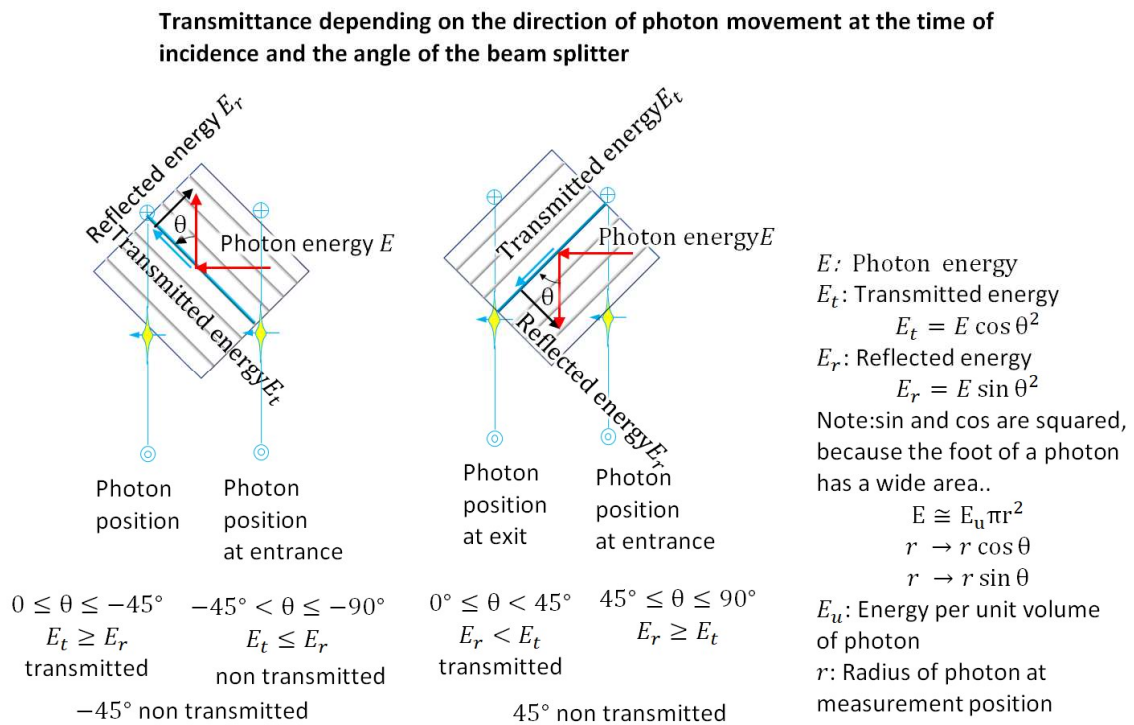


Fig.X39-6

However, the result of quantum entanglement between two photons is not known until it is measured but can be predicted at the time of photon generation.

X in Fig.X39-4 is a hidden variable. Applying this to the CHSH inequality yields the following equation.

$$(a + b) \frac{2\lambda}{X} \leq (a + a' + b - b') \frac{2\lambda}{X}$$

Since photons are found in two places, A and B, it is set to  $2\lambda$ .

However,  $\lambda \leq X$

Here,  $U = \frac{\lambda}{X}$  therefore

$$(a + b)2U \leq (a + a' + b - b')2U$$

$$\text{but, } 0 \leq U \leq \frac{1}{\sqrt{2}}, \quad \frac{1}{\sqrt{2}} \leq U \leq 1$$

In a twin photon pair, there is a correlation between A and B where A and B are the same, and a correlation where A and B are different. Fig.X39-7 can be drawn if the photon is given a value of 1 if it passes through the beam splitter, and 0 if it does not.

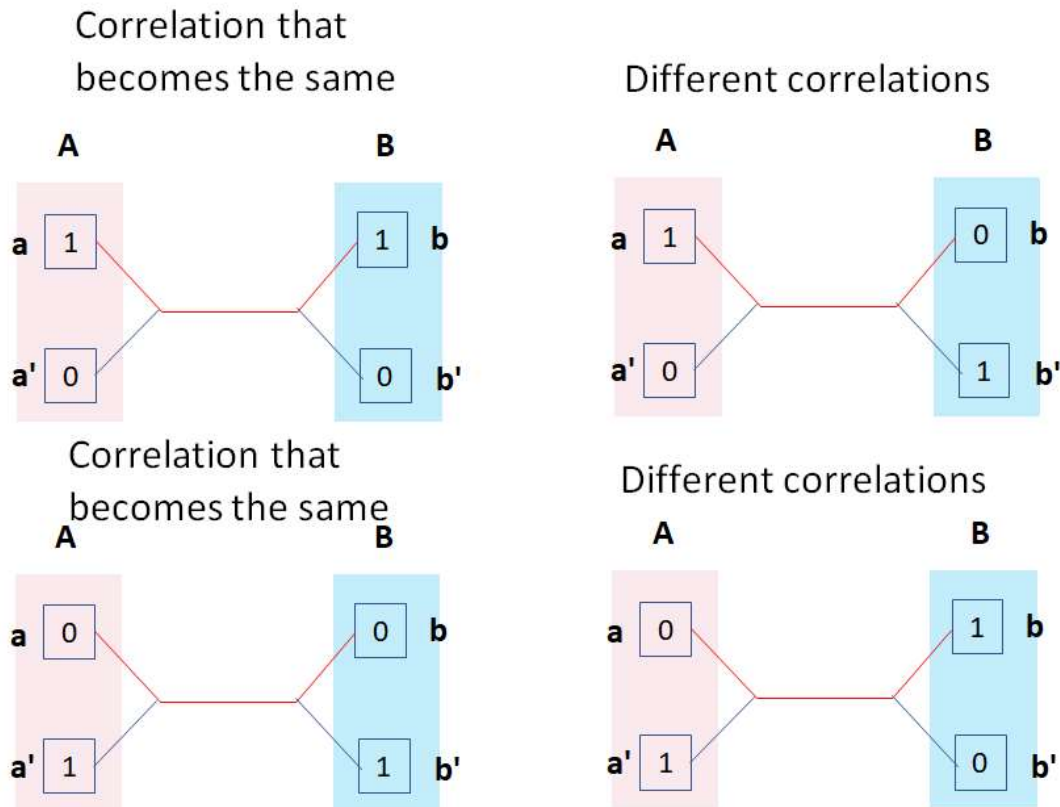


Fig.X39-7

Substituting this into the previous equation gives a maximum of  $2\sqrt{2}$  as shown below, which yields a result that violates the CHSH inequality.

$$U = \frac{1}{\sqrt{2}} \text{ then}$$

①  $a, b = 1, \quad a', b' = 0$  then

$$(1 + 1 + 0 - 0) \frac{1}{\sqrt{2}} = 2\sqrt{2}$$

②  $a, b = 0, \quad a', b' = 1$  then

$$(0 + 0 + 1 - 1) \frac{1}{\sqrt{2}} = 0$$

③  $a = 1, \quad b = 0, \quad a' = 0, b' = 1$  then

$$(1 + 0 + 0 - 1) \frac{1}{\sqrt{2}} = 0$$

④  $a = 0, \quad b = 1, \quad a' = 1, b' = 0$  then

$$(0 + 1 + 1 - 0) \frac{1}{\sqrt{2}} = 2\sqrt{2}$$

This shows that the correlation exhibited by entangled twin photon pairs is a quantum theoretical effect claimed in quantum mechanics, that is, the event is not determined for the first time as a result of observation but is a result that can be predicted by the law of causality. represent.

From these considerations, the following can be said.

The right-hand side of Bell's inequality must be  $2\sqrt{2}$ .

Note that the state of entangled particles is determined at the time of entanglement, not at the time of observation.

### X40. Bonding posture of protons and electrons in the atomic nucleus

A rotating wave of protons and a rotating wave of electrons flow in the same direction between them.

As a result, the energy reduces, and attractive force works.

The electron is pointing its progression axis toward the proton.

We know the next three points by this posture of the electron.

1. An electron transits in the direction of perpendicular to its spread plane.

A photon also has a form that reflects this spreading plane.

2. An electron on a proton orbit moves laterally.

Since the sides of the electron are attenuated, they do not generate waves in the lateral direction.

3. Because of the rotating waves of an electron and a proton, there is a band of existence probability of the particle part of the electron.

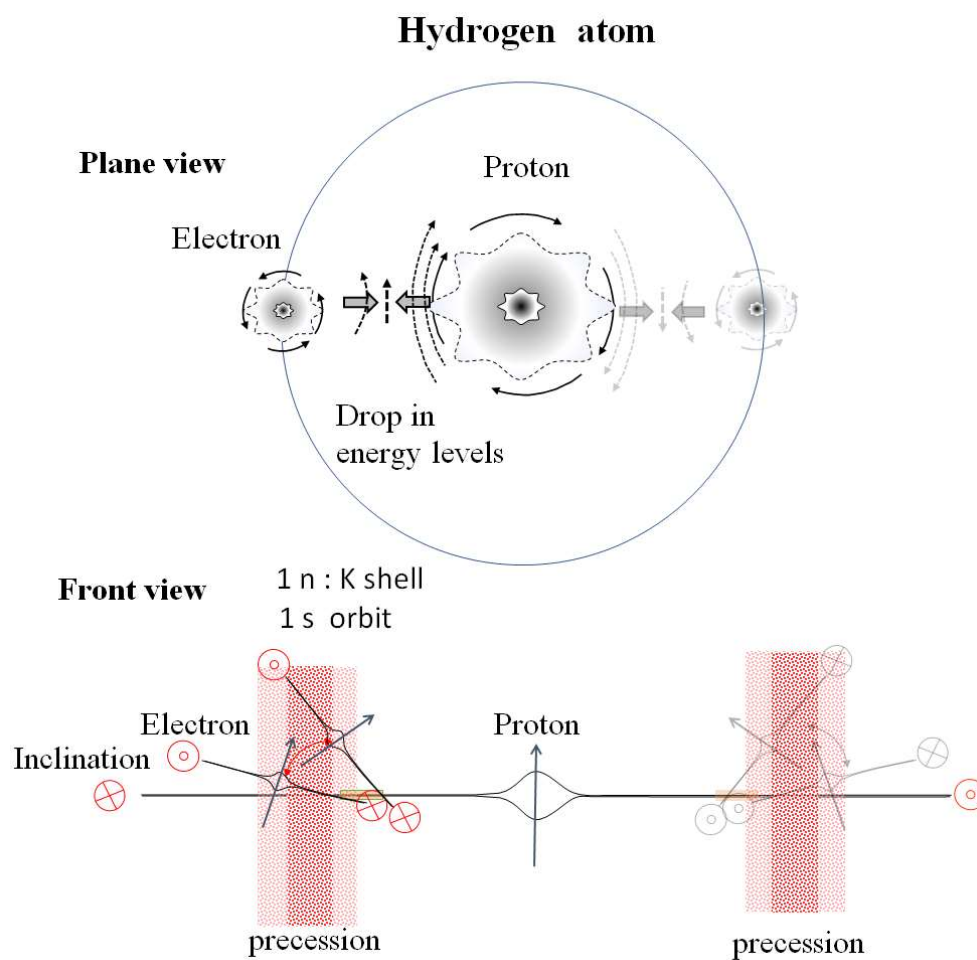


Fig.X40

**X41. Band where the probability of existence of electrons is zero.**

The characteristics of the 2S orbital of the L nucleus with four electrons are that the width of the orbital widens, and a band appears where the electron existence probability is zero. I would like to express my respect for the greatness and efforts of the researchers who solved the Schrödinger equation and described the appearance of the atom.

At the same time, I cannot help but be surprised that these are derived from the Schrödinger equation.

Of course, the atomic model of the energy body theory can also draw a similar figure. In particular, it is noteworthy that the reason can be given even to the band where the electron existence probability is zero (black band in the figure).

**Coupling of electron and proton (2S orbital of L nucleus with 4 electrons)**

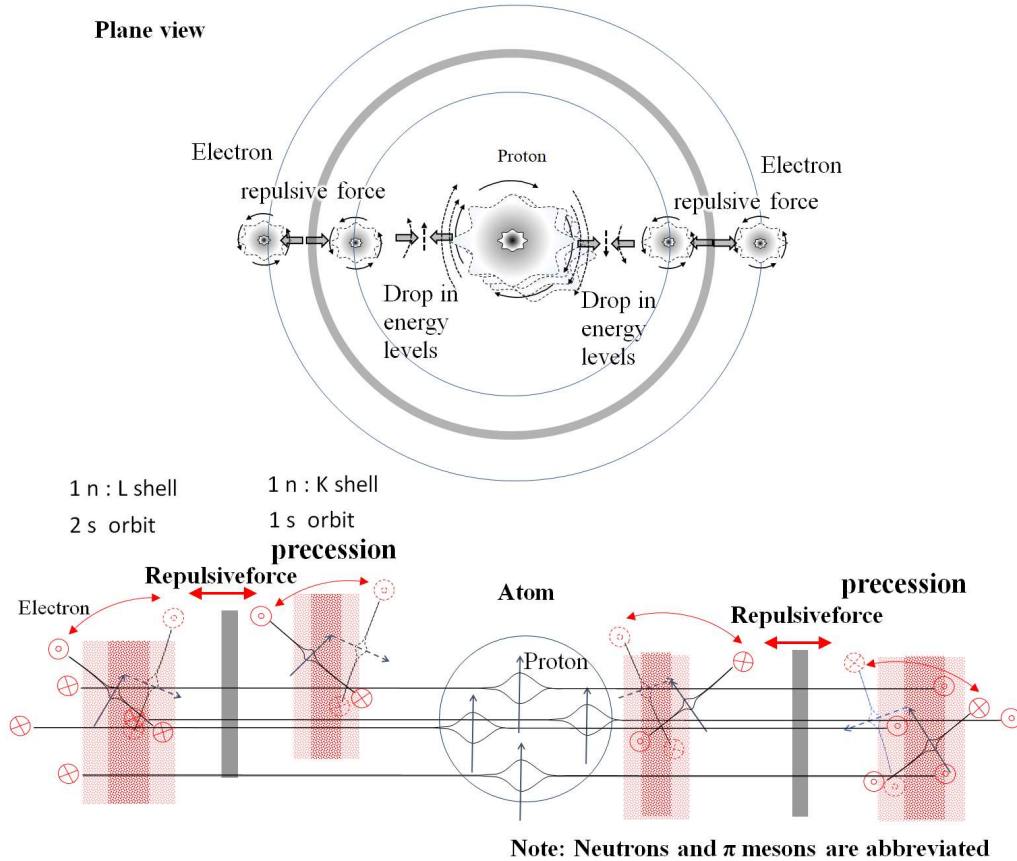


Fig.X41

**X42. Interaction of electrons and protons**

The wave of an electron rotates counterclockwise with respect to the Progress axis.

The wave of a proton rotates clockwise with respect to the Progress axis.

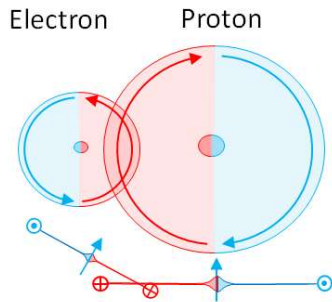


Between an electron and a proton, the waves move in the same direction.

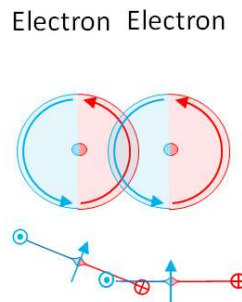
As a result, the energy drops, and an attractive force works.

Between an electron and an electron or a proton and a proton, the waves travel in opposite direction. Therefore, the energy increases, and a repulsive force works.

### Electromagnetic interaction



The direction of the wave at the contact part of the foot is the same → Increase in wave velocity → Extension of wavelength in the direction of rotation → Wrinkle-like waves in the radial direction occur for one wavelength of the wave in the direction of rotation → Decrease in energy → Generation of attractive force → Connection



The direction of the wave at the contact part of the foot is opposite → (Decrease in wave velocity → Shortening of the wavelength in the direction of rotation → Radial direction waves such as wrinkles are generated for one wavelength of the waves in the direction of rotation) → Actual, the base is distorted before wrinkling waves are formed → increase in energy → generation of repulsive force → repulsion

Fig.X42

### X43. Electromagnetic force as restoring force of distortion angle.

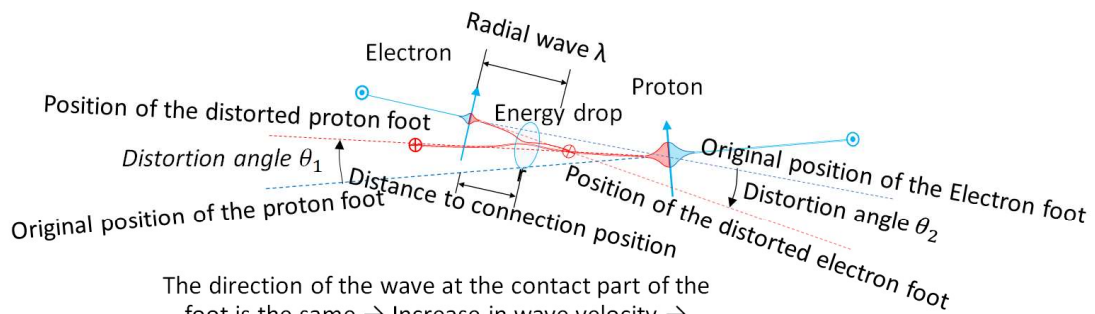
Electromagnetic interaction is the restoring force of distortions caused by the contact of rotating wave foots of protons or electrons.

If the waves travel in the same direction at the contact point, an attractive force will act, and if the directions are opposite, a repulsive force will act.

The restoring force is the magnitude of the distortion angle of the foot of a rotating wave of protons, or the magnitude of the distortion angle of the foot of a rotating wave of electrons.

Since both distortion have an action/reaction relationship, the distortion energy is the same. Therefore, the restoring force is also the same. This is why electrons and protons have the same charge even though their sizes are different.

### Binding mechanism between different charges



The direction of the wave at the contact part of the foot is the same → Increase in wave velocity → Extension of wavelength in the direction of rotation → Wrinkle-like waves in the radial direction occur for one wavelength of the wave in the direction of rotation → Decrease in energy → Generation of attractive force → Connection

Restoring force is the force of interaction

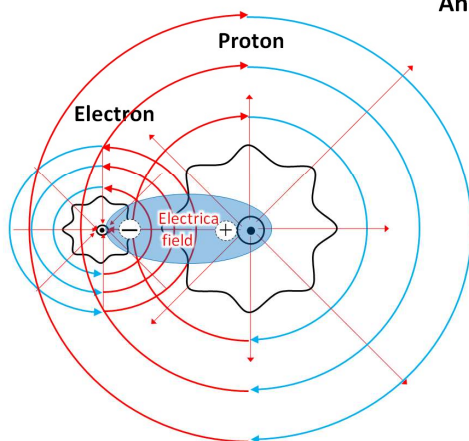
Fig.X43

### X44. Electric field created by rotating waves of electrons and protons.

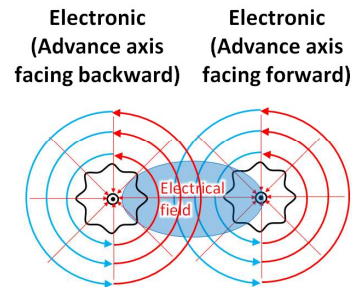
The electric field is the foot of the rotating waves of electrons on the lines connecting the charges. If the two waves are in the same direction, an attractive force works, and if they are in opposite direction, a repulsive force works.

#### Electric field

##### Electric field created by electrons and protons



##### An electric field created by a pair of electrons



The electric field is the foot of the rotating waves of an electron or a protons on the line connecting the two. If the two waves are in the same directions, there is an attractive force, and if they are in opposite directions, there is a repulsive force. In the case of the above figure, an attractive force acts. In addition, since the rotating waves of protons covers the whole, unlike the case of electrons pair with the shape of the front and of the back, there is no entrance and exit of the magnetic field.

The electric field is the foot of the rotating waves of an electron or a proton on the line connecting the two. If the two waves are in the same directions, there is an attractive force, and if they are in opposite directions, there is a repulsive force acts.

Fig.X44

**X45. Magnetic and electric fields created by rotating waves of electrons and protons.**

The electric field is foot of rotating wave of an electron or a proton on the line connecting the two charges.

The magnetic field is the spreading foots of the rotating waves of electrons perpendicular to the electric field.

Magnetic poles are entrance and exit for rotating waves created between a back-front pair of electrons.

Therefore, there is no single magnetic pole.

Because the foot of the rotating proton wave is large, the electron-proton pair does not have a clear wave entrance and exit. Therefore, the magnetic field is also not clear.

**The electric field is the foot of the rotating waves of an electron or a proton on the lines connecting the two  
The magnetic field is the foot of the rotating waves of electrons perpendicular to the electric field.**

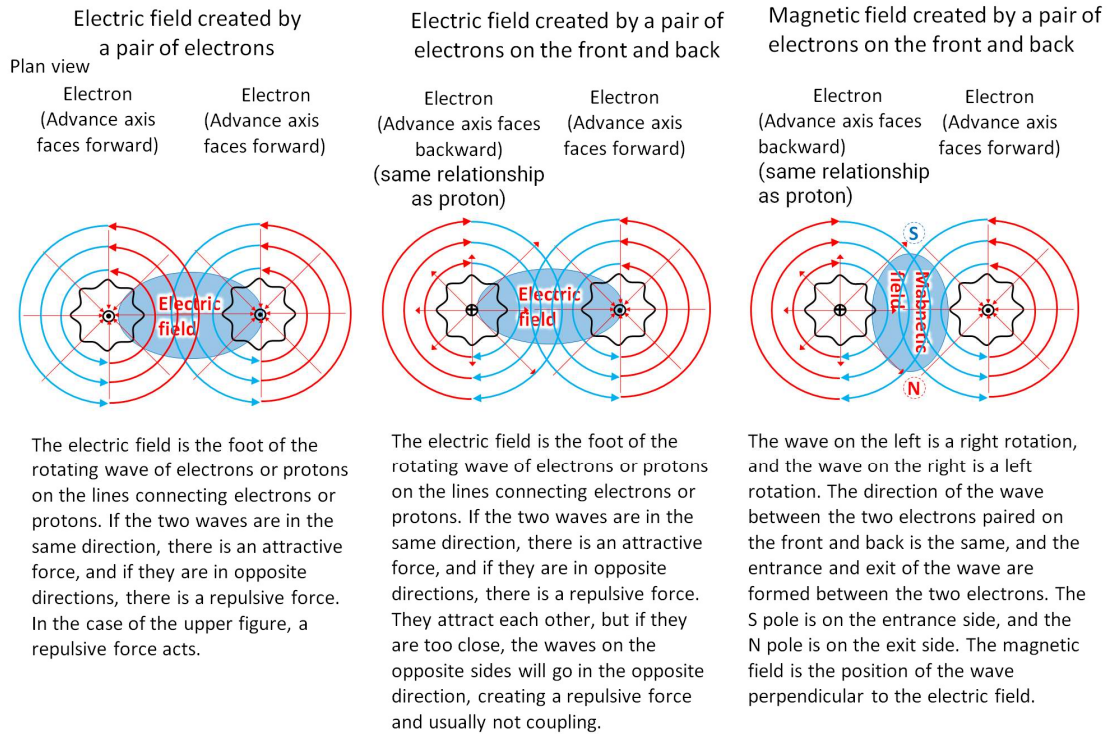


Fig.X45

**X46. Neutralization of electric field due to vertical and horizontal alignment of electrons and protons**

When electrons or protons are lined up vertically, the rotating waves of them cancel each other out and no electric field appears.

**An electric field cannot be created when electric charges (electrons or protons are arranged vertically (they cancel each other out)**

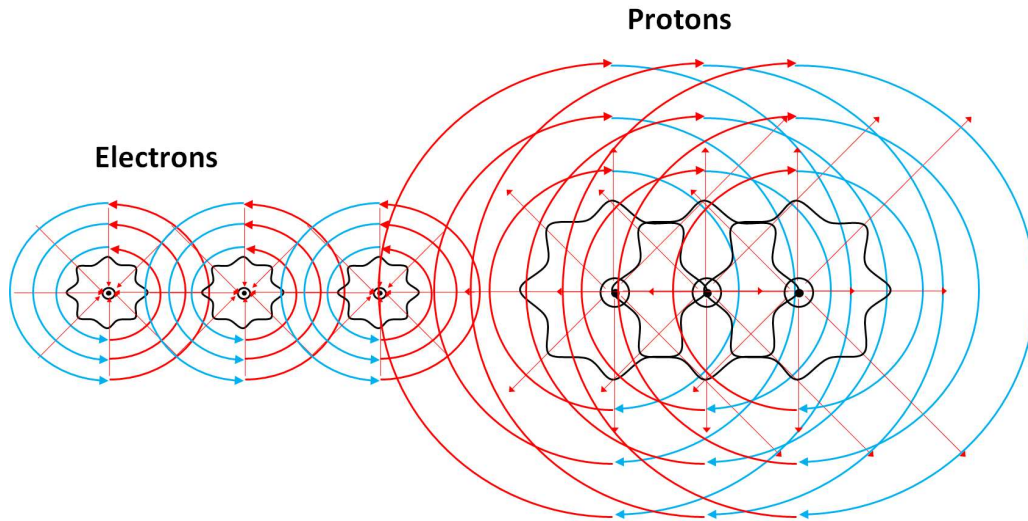


Fig.X46-1

When charges are placed side by side, the rotating waves of charges do not cancel each other out, so an electric field appears.

**An electric field is created by arranging electric charges (electrons or protons side by side)**

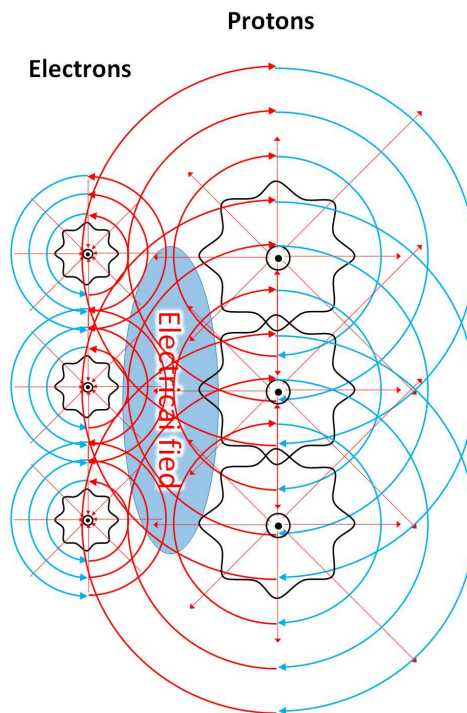


Fig.X46-2



### X47. Electron posture where magnetic field appears.

When current flows, the electrons turn and take a perpendicular posture to the lead wire. It is for this reason that a magnetic field is generated around the conductor.

When current passes through a coil, it becomes an electromagnet.

The reason for this is that the electrons perpendicular to the lead wire of the conductor make a front and back pair facing each other.

### Magnetic poles appearing due to the current flowing through the coil

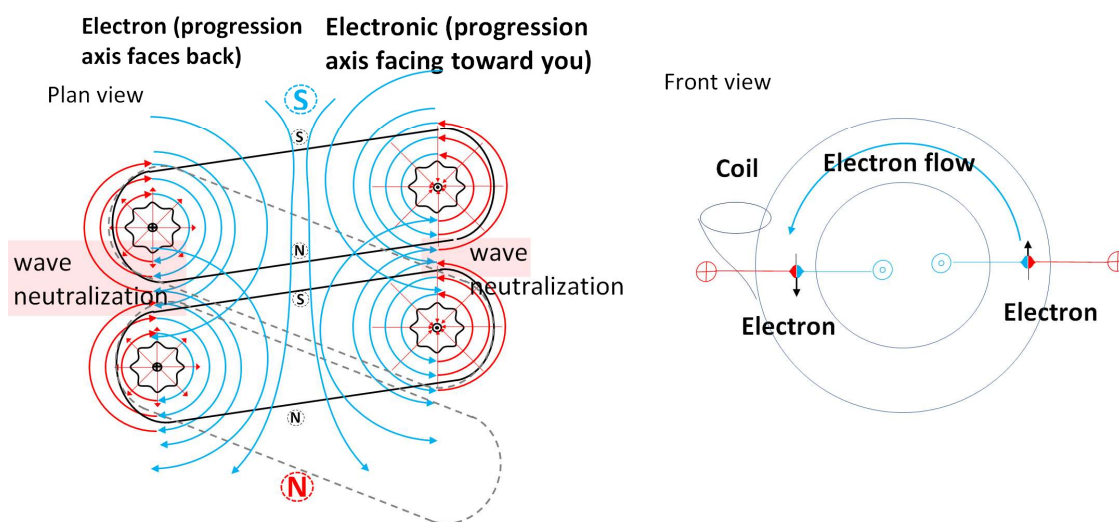


Fig.X47

### X48. Electrons at absolute zero

At absolute zero, the spreading wave foot (field) of rotating elementary particles shrinks and disappears.

In other words, the field disappears, and no electromagnetic interaction occurs through the field.

The gravitational field has positive energy, the dark energy field has negative energy, and the boundary between them is standard temperature.

Bose-Einstein condensation is thought to occur in bosons with zero or integer spin, but based on energy body theory, it is thought that it can also occur in fermions with half-integer spin. The reason for this is that at extremely low temperatures, the foot of rotating waves of particles that engage in electromagnetic interaction becomes narrower, regardless of whether they are bosons or fermions. When the temperature drops further beyond absolute zero, the particles are thought to begin to melt. But we don't know what that

temperature is. The temperature at which the particle part begins to melt is very important. This is because that temperature is the standard temperature of energy bodies. This is because the gravitational field in a high-energy state and the dark energy field in a low-energy state separate at that temperature.

Fig.X48-1 depicts how the particles become narrower and more tightly packed. As a result of countless particles gathering densely at one point, the wave of rotating particles looks like a wave of a single particle.

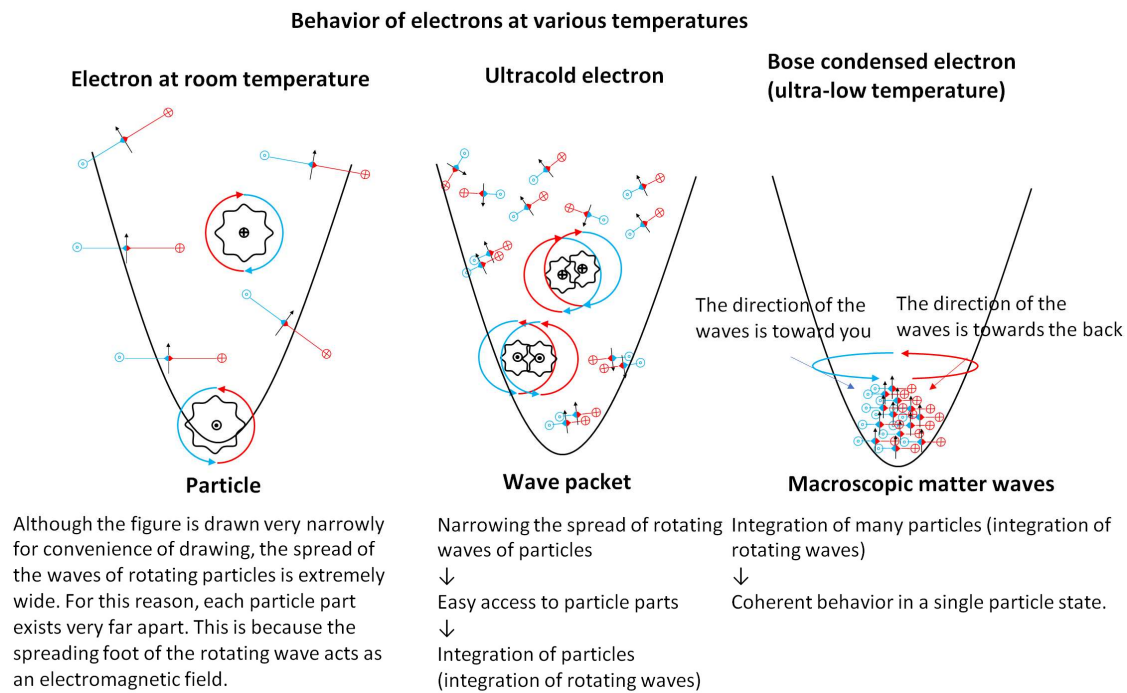


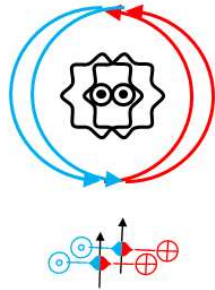
Fig.X48-1

Fig.X48-2 depicts electrons forming pairs like boson particles. Originally, repulsive forces act between electrons, but when their progress axes are in opposite directions, the foot of rotating waves between them move in the same direction. For this reason, attractive force acts. However, if they get too close due to attractive force, the foots of each wave will now reach opposite sides. In this case, the waves move in the opposite direction and a repulsive force acts, so the electrons usually do not combine with each other. The lower diagram in Fig.48-2 shows the principle of superconductivity. Electrons on the transmitting side drag electrons on the receiving side, whose progress axis is opposite, and transmit electrical energy. Electrical energy is the distortion of the spreading foot of a rotating wave of electrons. In fact, electrical energy is transported in this same form even at room temperature. It was not clear how electrical energy is transported, but this has now been

elucidated using energy body theory. The difference between room temperature and absolute zero is the width of the foot of the rotating wave of electrons. In other words, superconductivity occurs when the width of the foot decreases until it no longer makes contact with the metal atoms of the conductor. This is the same principle that allows neutrinos to pass through matter without resistance.

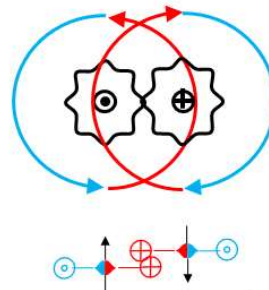
## Cooper pair of electrons (bosonization)

When the spins are parallel



$$\text{Synthetic spin} = \frac{\hbar}{2} + \frac{\hbar}{2} = \hbar$$

When the spins are antiparallel



$$\text{Synthetic spin} = \frac{\hbar}{2} - \frac{\hbar}{2} = 0$$

※1. When the spins are antiparallel, the relationship is that of an electron and a positron (annihilation).

2. In the case of superconductivity, the spins are antiparallel.

## Principle of superconductivity

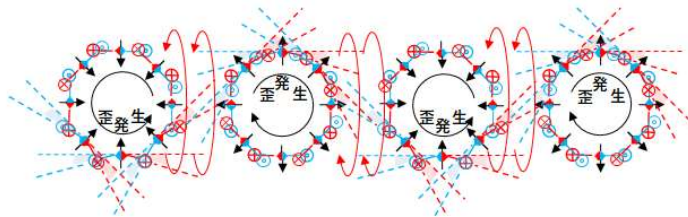


Fig.X48-2



## Temperature variation of electrons turn and propagation of distortion angle in a conductor carrying alternating current

electrons turn and propagation of distortion angle in a conductor carrying alternating current

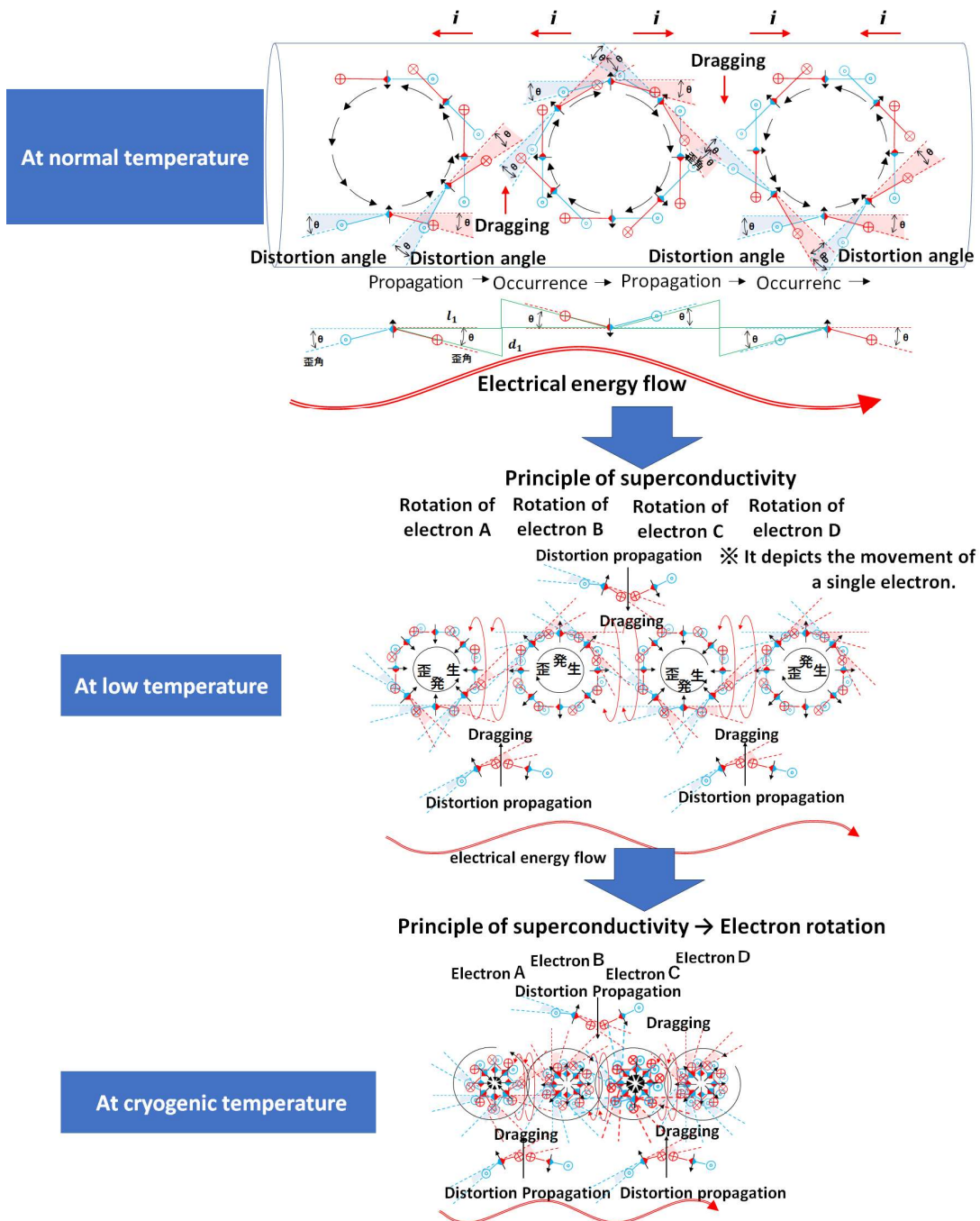


Fig.X48-3

When a metal becomes superconducting, it becomes completely diamagnetic, so magnetic lines of force cannot penetrate into its interior. Although this phenomenon appears

simultaneously with superconductivity, this effect cannot be explained solely by the superconductivity that characterizes superconductivity.

In the energy body theory, it can be considered as follows.

The main reason for superconductivity is thought to be that due to the extremely low temperature, the waves of free electrons that spread out and rotate become narrower and no longer interact electromagnetically with electrons in the conductor.

The Meissner effect increases the density of free electrons because the spread of the rotating wave of free electrons becomes narrower. Furthermore, since there is no spreading of the rotating wave of free electrons (an electromagnetic field that causes electromagnetic interaction), even if an external magnetic field is applied, there is no electromagnetic interaction with the external magnetic field. Therefore, the free electrons do not change their posture and are repelled by the external magnetic field.

When the magnetic field penetrates inside the conductor, it intersects with the thinly spread foot of rotating wave of free electrons. The electron then rotates its position to avoid the energy of the magnetic field and assumes a position parallel to the magnetic field. Since the magnetic field can be thought of as a very thin layer of film, the electrons enter between this thin layer and become stable, with an orientation parallel to the magnetic field layer. Fig.X47.4 depicts this situation. In other words, at normal temperatures, when a magnetic field enters the inside of a conductor, the posture of free electrons in the conductor is parallel to the magnetic field, trying to avoid friction with the magnetic field. Therefore, the magnetic field can enter the inside of the conductor. However, when it comes to extremely low temperatures, things are different. There are two reasons for this.

First, the width of this spreading foot narrows, and the electromagnetic field created by free electrons inside the conductor decreases. As a result, the rotating waves of the electrons do not have a widely spread foot, so they cannot take a position parallel to the magnetic field. In other words, electrons do not try to avoid magnetic fields that enter from outside. Inside the conductor, there is a wide space where there is no magnetic field of electrons, so it would seem that the magnetic field could easily penetrate, but this is not the case. Because the second reason hinders the penetration of magnetic fields.

Second, when the foot of the rotating waves of electrons no longer spreads and a space free of electromagnetic fields expands inside the conductor, it becomes easier for electrons to approach each other. In other words, since the particle part of electrons comes closer to each other, the density of electrons increases, and the frequency with which the magnetic field is rejected increases. As a result, the magnetic field cannot penetrate into the superconductor. Fig.X47-4 depicts this situation. This is the reason why the Meissner effect occurs. However, it is not possible to determine the detailed behavior of the electrons, such as

whether the electrons are bonded together to form a Booth-Einstein particle.

### Normal current, supertransmission, and Meissner effect

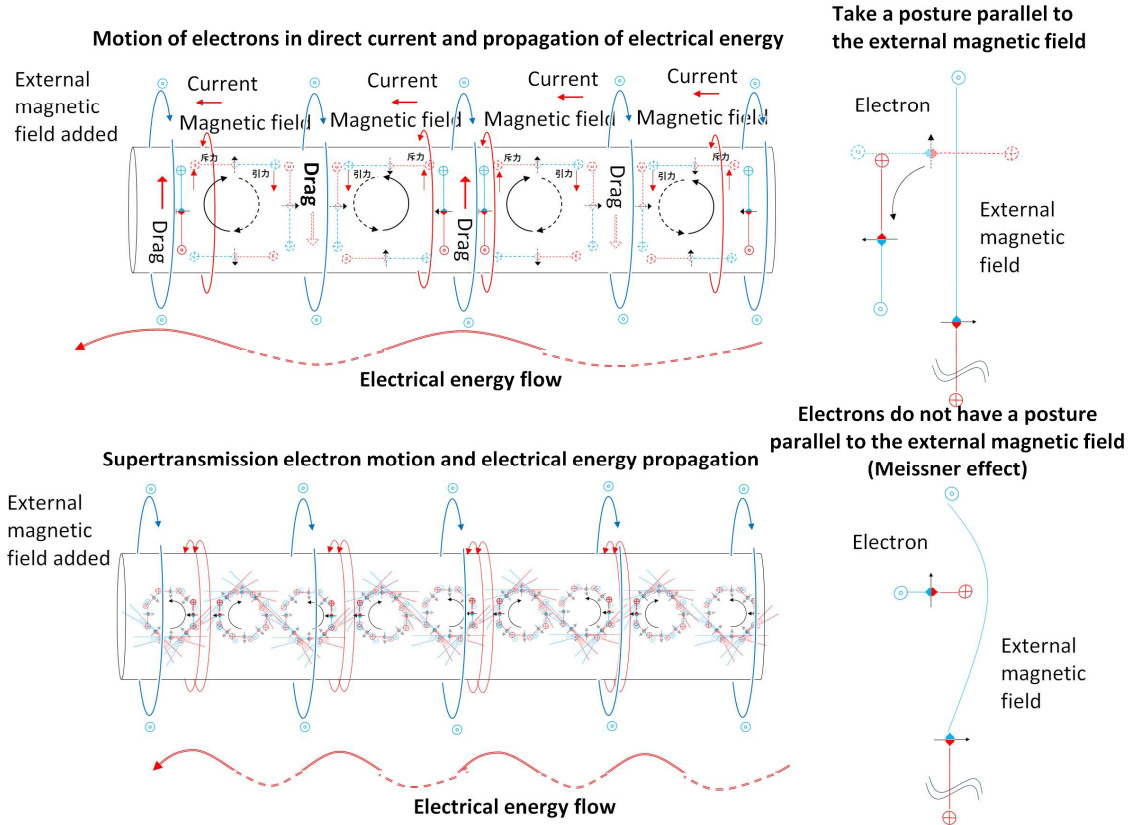


Fig.X48-4

### X49. Posture of electrons that make a magnet.

A magnet is a state in which the waves of electrons spreading while rotating is polarized and aligned.

The wave entrance is the south pole, and the exit is the north pole.

When the poles are the same, the directions of the waves are reversed, so the energy rises and repulsive force acts.

When the poles are different, the directions of the waves are the same, so the energy drops, and the attraction works.

## Action between magnets

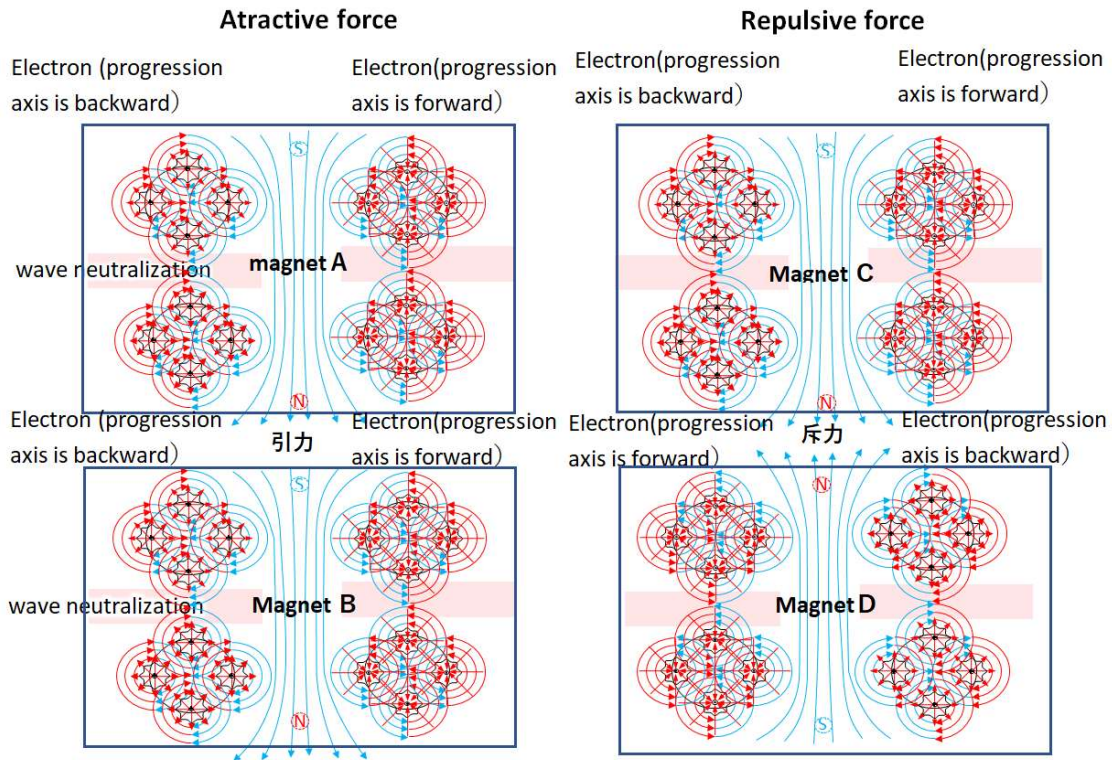


Fig.X49

### X50. Electron posture in electromagnetic field

The posture of the electrons (the spread of the rotating waves) is responsible for the appearance of the electromagnetic field.

When placed horizontally along the conductor, the waves cancel each other out.

Therefore, no electric field appears in the conductor.

The spread of electron waves in the direction perpendicular to the electric field is the magnetic field.

If they are arranged vertically along the conductor, the waves do not cancel each other out.

Therefore, a magnetic field appears around the conductor.

In fact, electrons do not move from the cathode to the anode.

They are rotating inside the wire.

## Electronic posture in the coil stretched out on a straight line

### Relation of a magnetic field and an electric current

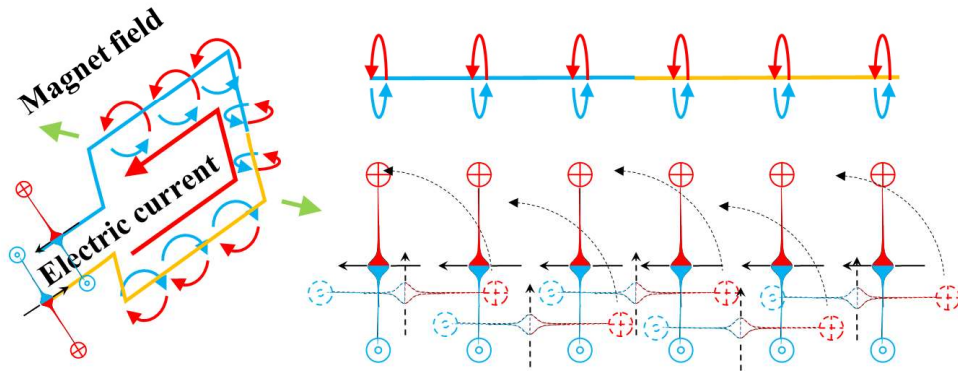


Fig.X50

### X51. Maxwell's first equation

Maxwell's first equation states that if there is an electric charge, the electric field will diverge.

In energy body theory, the spread of the rotating wave of protons or electrons is the electric field.

Energy is attenuated radially from the central particle part.

## Maxwell's equation 1

$$\nabla \cdot \mathbf{D} = \rho$$

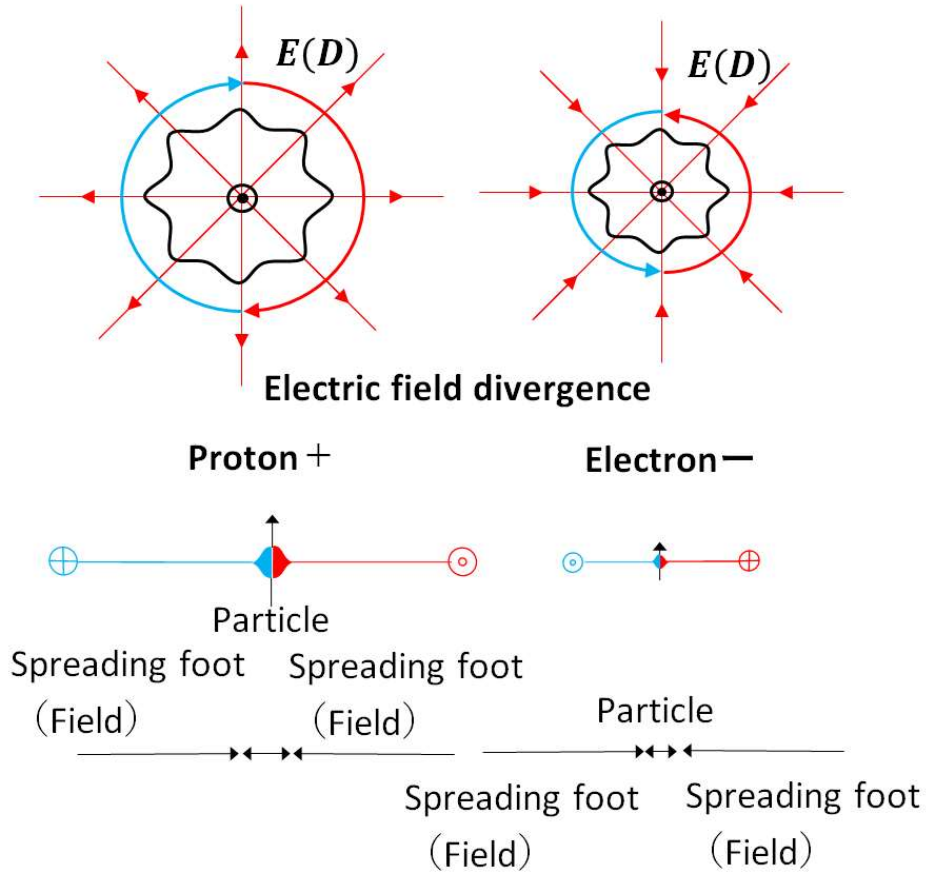


Fig.X51

### X52. Maxwell's second equation

Maxwell's second equation states that a changing magnetic field creates an electric field.

In the energy body theory, the posture of the rotating electron tilts horizontally with the conductor and becomes an electric field.

However, in a wire, the rotating waves of electrons cancel each other out and do not appear as an electric field.



## Maxwell's equations 2

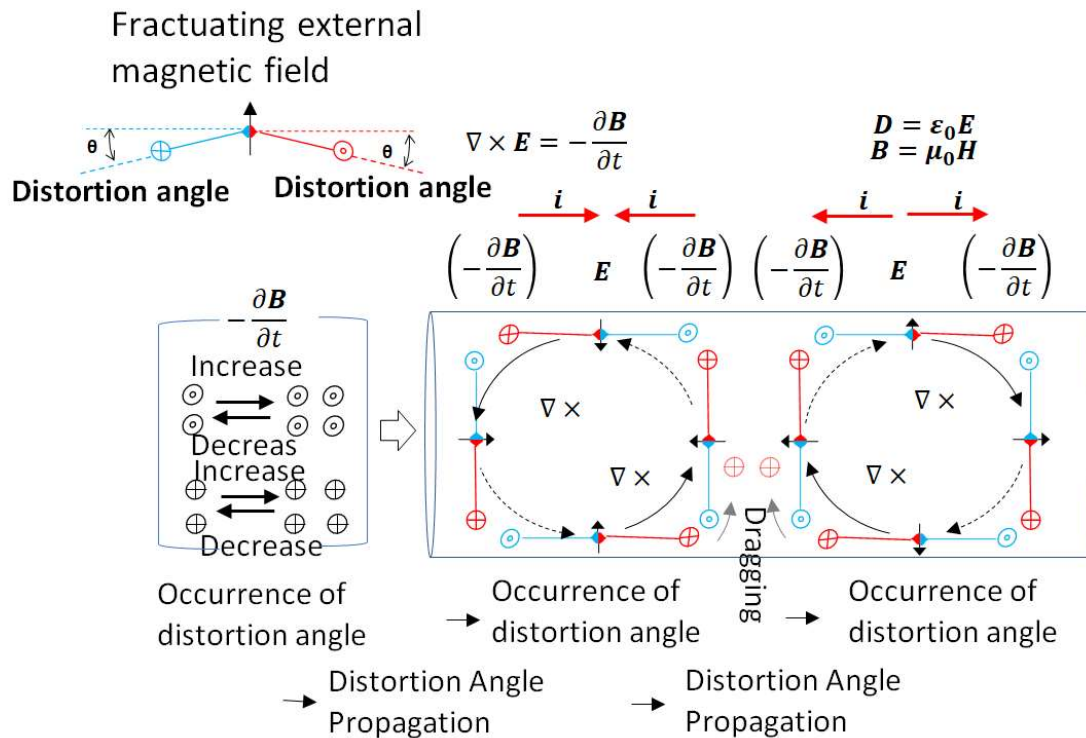


Fig.X52

When the changing external magnetic field  $B$  causes the electric field  $E$  (electrons polarized horizontally in the direction of the wire) to  $\nabla \times$  (the effect of rotating the electrons in the vertical direction), it creates a magnetic field  $H(B/\mu_0)$  around the current. Or rather, the spinning of the electrons are the current  $i$  itself. By continuing to rotate the electrons, it becomes the current. The horizontally polarized electrons in the middle of the electron's turning creates the electric field  $E(=D/\epsilon_0)$ , and vertically polarized electrons are a magnetic field  $H$  around the electric current. Whereas horizontal electron waves do not appear as an electric field due to neutralizing each other, except in a space without conductors such as capacitors. The electrical energy that causes this phenomenon is the distorted angle of the spreading electron waves which propagates by the drags with the electrons turning. The origin of the electrical energy is the fractuation (increase or decrease) of the external magnetic field. The effect is depending on the direction of an electron wave and a magnetic field, in the case of same wave directions acts as an attractive force, and the different wave directions act as a repulsive force.”



### X53. Maxwell's third equation

Maxwell's third equation states that the magnetic field does not diverge because there is no magnetic charge.

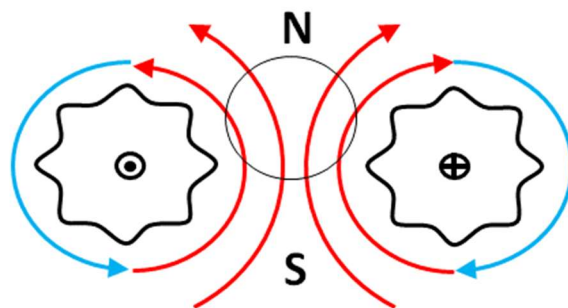
In the energy body theory, the magnetic field is the spread of foot of rotating electron's wave generated in the vertical direction between the charges.

Energy vertically decays between charges.

### Maxwell's equations 3

$$\nabla \cdot \mathbf{B} = 0$$

$$\mathbf{H}(\mathbf{B})$$



The magnetic field does not diverge.

Electronic/Front

Electronics/Back

Fig.X53

### X54. Maxwell's fourth equation

Maxwell's fourth equation states that an electric current and a changing electric field create a magnetic field.

In the energy body theory, the posture of the rotating electrons tilts in the direction perpendicular to the conductor, creating a magnetic field.

An electric current is a trailing chain of rotating electrons.

Supplementally, the fact that the conductor on the right end of the figure is separated means that even if the conductors are separated, the drag of the rotating electrons is chained.



rotating waves of electrons or protons).

Rotating waves of electrons in an electric field have an attractive force in the front because both waves are in the same direction and have a repulsive force in the back because each wave are in the opposite direction.

Since the attractive force and repulsive force are in the same directions of vector, the electrons move forward.

However, inside the conductor, there are foots of rotating waves of electrons (magnetic field) that are polarized perpendicular to the conductor, so the electrons collides with the magnetic field. The relatively changed energy density of the magnetic field changes the direction of the moving electrons. This is the second force.

That is the cause that the motion of the electrons turning in the inside of the conductor.

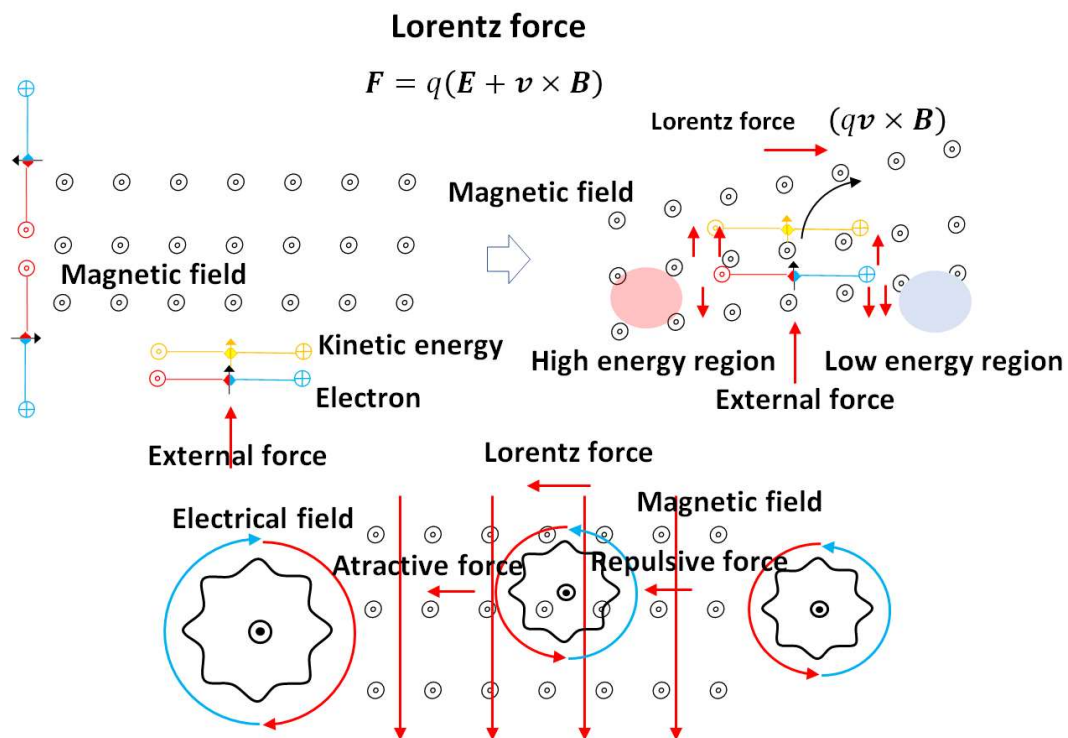


Fig.X55

## X56. Two phenomena that cause electromagnetic induction.

### X56.1. Current understanding

There are two phenomena in the generation of electromagnetic induction. Type A is a phenomenon that when a magnetic field approaches or leaves a stationary coil, a current is generated in the conductor. This is when electrons begin to move due to an electric field

generated in a conductor, creating an electric current. The other type, B, is a phenomenon that when a conductor is moved inside a stationary magnet, current flows through the conductor. This is because an electromotive force acting on electrons is generated by the Lorentz force, resulting in an electric current. Type A is explained by the action of Faraday's law as the action of the electric field. Type B is explained by the Lorentz force as an action of a magnetic field, and in electromagnetism it is understood as a fundamentally different phenomenon. In this way, the generation of electromotive force in the two mechanisms is completely different, but the relationship between the change in magnetic flux passing through the circuit and the electromotive force is exactly the same, including the direction. This phenomenon is known as a problem that even Feynman could not solve (see note). This mysterious phenomenon was solved using the energy body theory as follows.

**Type A:** Current flows through the circuit when the magnetic flux passing through the circuit changes over time.

The current flows in such a way that the new magnetic field created by the current cancels out changes in the magnetic flux passing through the circuit.

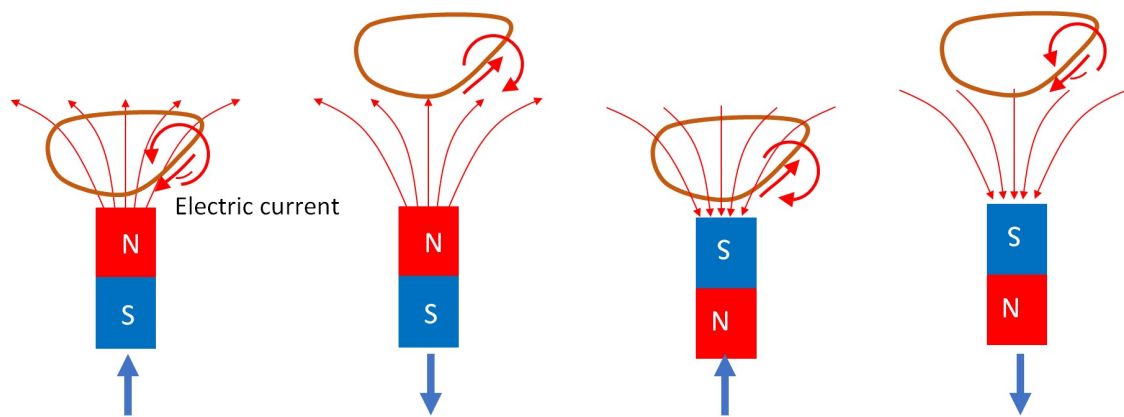
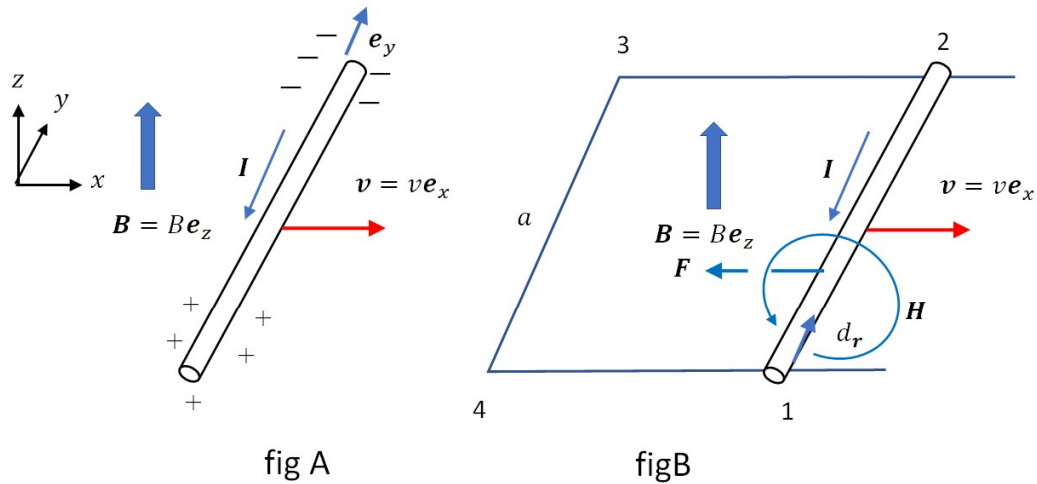


Fig.X56.1-1

**Type B:** Even if the magnetic field does not change over time, when a part of the circuit moves in the presence of a magnetic field, current flows in that circuit. The current flows in the direction that creates the force that impedes the movement of the part of the circuit responsible.

## When part of a circuit crosses a uniform magnetic field



When we move the conductor rod to the right at a constant speed  $v$  across the magnetic flux density  $B$ , current  $I$  flows toward us. (It is charged when it is not connected to the circuit.) Then, a Lorentz force  $F$  to the left and a magnetic field  $H$  are generated around the conductor.

Fig.X56.1-2

### X56.2. Understanding based on energy body theory.

#### X56.2.1. Type A electromagnetic induction

When the magnetic flux passing through the circuit changes over time, current flows through the circuit. The current flows in such a way that the new magnetic field created by the current cancels out changes in the magnetic flux passing through the circuit.

#### Approach of N pole

As the magnetic field inside the coil (forward) increases, the energy outside the coil decreases relatively. Therefore, the rotating waves of electrons inside the wire (forward) are drawn by the magnetic field outside the coil (forward), which has a relatively low energy, and draw an arc that becomes perpendicular to the wire. Fig.X56.2.1-1 left.

#### Departure of N pole

As the magnetic field inside the coil (forward) decreases, the energy outside the coil increases relatively. Therefore, the rotating waves of electrons inside the conductor

(forward) are drawn by the magnetic field inside the coil (facing the hand), which has reduced energy, to draw an arc and become perpendicular to the conductor. Fig.X56.2.1-1 right

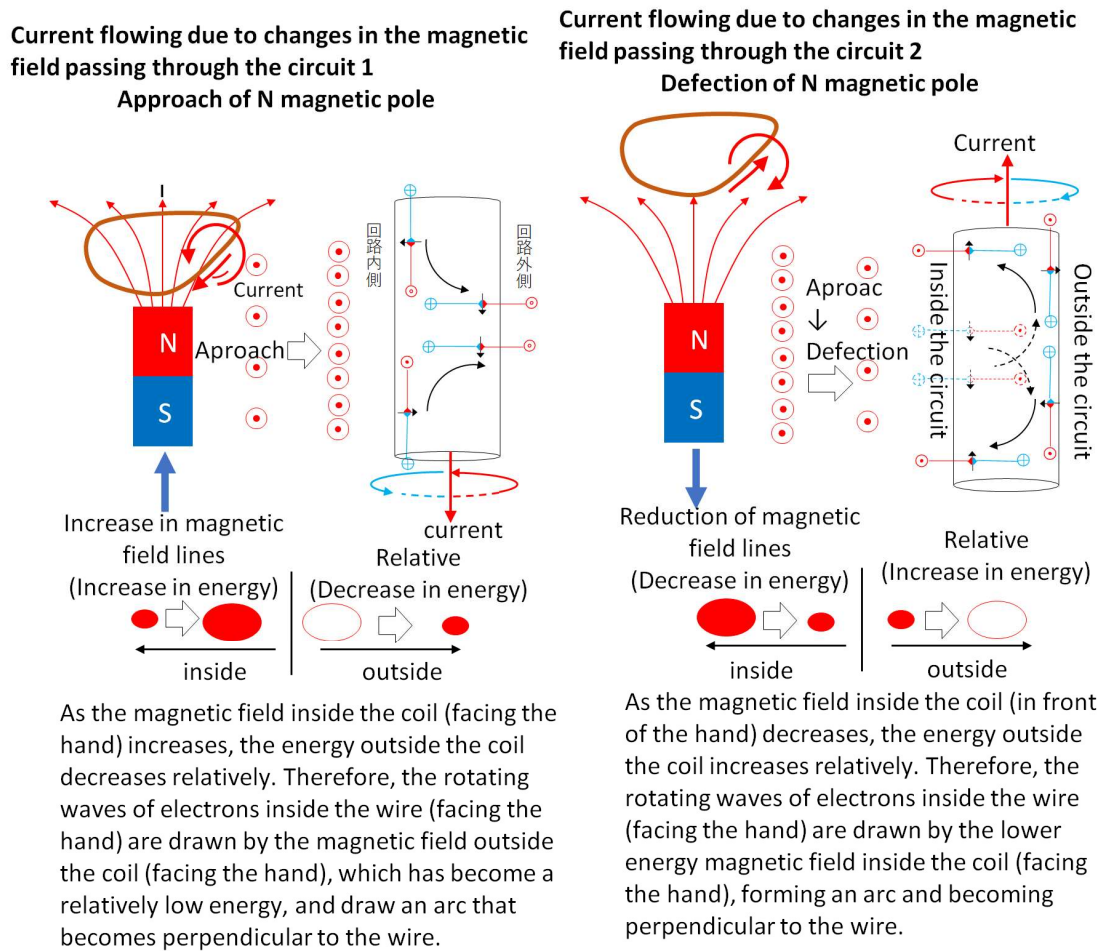


Fig.X56.2.1-1

**Approach of S pole**

As the magnetic field (backward) inside the coil increases, the energy outside the coil decreases relatively. Therefore, the rotating waves of electrons inside the conductor (backward) are drawn by the magnetic field outside the coil (backward), which has a relatively low energy, and draw an arc to become perpendicular to the conductor.

Fig.X56.2.1-2 left

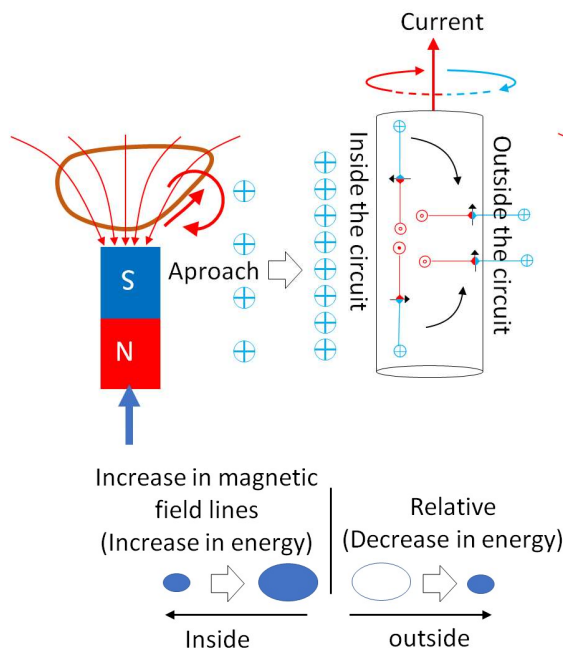
**Departure of S pole**

As the magnetic field (backward) inside the coil decreases, the energy outside the coil



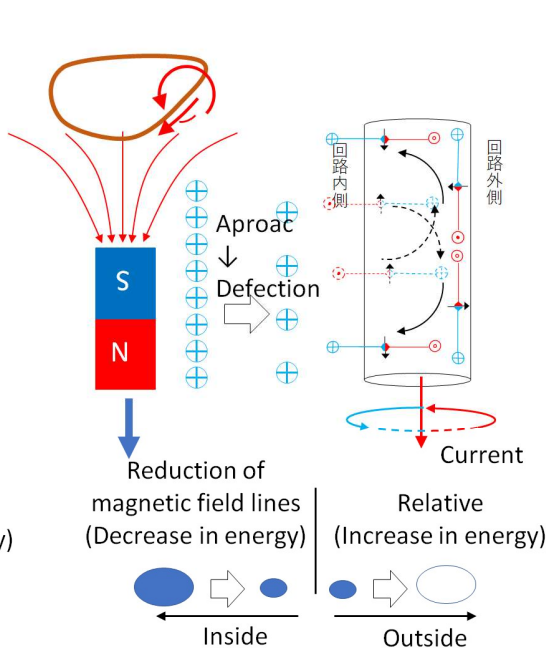
increases relatively. Therefore, the rotating waves of electrons inside the conductor (backward) are drawn by the magnetic field inside the coil (backward), which has reduced energy, and draw an arc that is perpendicular to the conductor. Fig.x56.2.1-2 right

**Current flowing due to changes in the magnetic field passing through the circuit 3**  
**Approach of S magnetic pole**



As the magnetic field (inward direction) inside the coil increases, the energy outside the coil decreases relatively. Therefore, the rotating waves of electrons inside the conductor (toward the back) are drawn by the magnetic field outside the coil (towards the back), which has a relatively low energy, and draw an arc to become perpendicular to the conductor.

**Current flowing due to changes in the magnetic field passing through the circuit 4**  
**Defection of S magnetic pole**



As the magnetic field (inward) inside the coil decreases, the energy outside the coil relatively increases. Therefore, the rotating waves of electrons inside the conductor (towards the back) are drawn by the magnetic field inside the coil (towards the back), which has reduced energy, and draw an arc that is perpendicular to the conductor.

Fig.X56.2.1-2

**X56.2.2. Type B electromagnetic induction**

Even if the magnetic field does not change over time, if a part of the circuit moves in a place where the magnetic field exists, current will flow in that circuit. The current flows in a direction that creates a force that impedes the movement of the part of the circuit responsible.

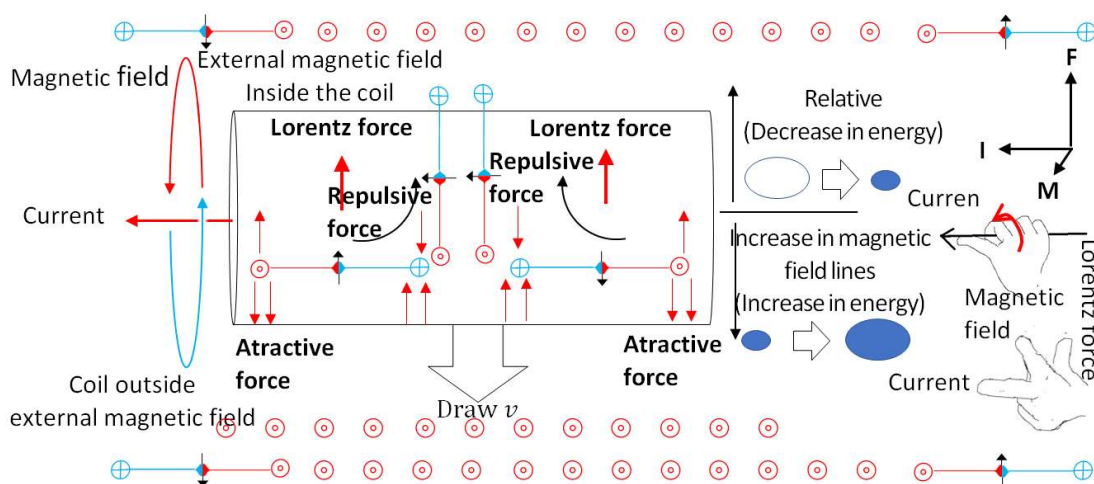
**Drawing conductors**



Fig.X56.2.2-1 depicts that when a conducting wire is pulled toward you in a magnetic field, the free electrons in the conducting wire rotate in an arc and become a posture perpendicular to the conducting wire.

As the magnetic field outside the coil (facing the hand) increases, the energy inside the coil decreases relatively, and an upward Lorentz force appears. Therefore, the electrons inside the conductor are drawn upward. On the other hand, the rotating waves of electrons (the left and right sides have different directions) are subject to attractive and repulsive forces depending on the direction of the magnetic field (forward) and are balanced in front and behind the electron waves. However, by pulling the conductor downward, as shown in the Fig.X56.2.2-1, the front-to-back balance is disrupted, and the electrons rotate. Therefore, the electron moves upward while tracing an arc trajectory.

### Electromotive force generated in a conductor moving in a static magnetic field 1 Drawing



As the magnetic field outside the coil (facing the hand) increases, the energy inside the coil decreases relatively, and an upward Lorentz force appears. Therefore, the electrons inside the conductor are drawn upward. On the other hand, the rotating waves of electrons (the left and right sides have different directions) are subject to attractive and repulsive forces depending on the direction of the magnetic field (toward the front of the hand), and are balanced in front and behind the electron waves. However, by pulling the conductor downward, as shown in the figure, the front-to-back balance is disrupted and the electrons rotate. Therefore, the electron moves upward while tracing an arc trajectory.

Fig.X56.2.2-1

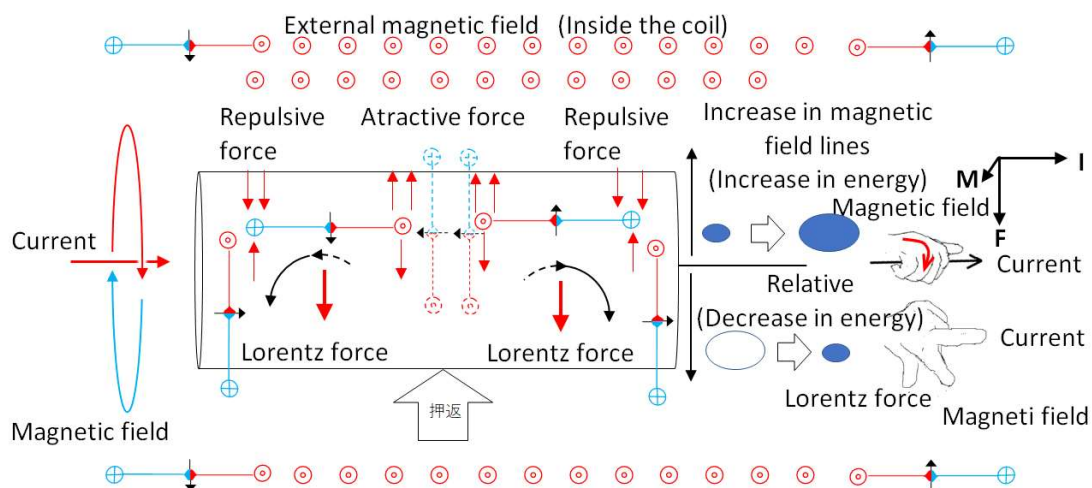
### Pushing back the conductor.

Fig.X56.2.2-2 shows that when a conductive wire is moved toward you in a magnetic field

and then pushed back, the free electrons in the conductor rotate in an arc and become a posture perpendicular to the conductor.

As the magnetic field inside the coil (forward) increases, the energy outside the coil decreases relatively, and a downward Lorentz force appears. Therefore, the electrons inside the conductor are drawn downward. On the other hand, the rotating waves of electrons (the left and right sides have different directions) are subject to attractive and repulsive forces depending on the direction of the magnetic field (forward) and are balanced in front and behind the electron waves. However, by pushing the conductor back upwards, as shown in the Fig.X5-6, the front-to-back balance is disrupted, and the electrons rotate. Therefore, the electron moves downward while tracing an arc trajectory.

### Electromotive force generated in a conductor moving in a static magnetic field 2 Pushing back



As the magnetic field inside the coil (facing the hand) increases, the energy outside the coil decreases relatively, and a downward Lorentz force appears. Therefore, the electrons inside the conductor are drawn downward. On the other hand, the rotating waves of electrons (the left and right sides have different directions) are subject to attractive and repulsive forces depending on the direction of the magnetic field (toward the front of the hand), and are balanced in front and behind the electron waves. However, by pushing the conductor back upwards, as shown in the figure, the front-to-back balance is disrupted and the electrons rotate. Therefore, the electron moves downward while tracing an arc trajectory.

Fig.X56.2.2-2

## X57. Electrical energy

### X57.1. Propagation method

Finally, I reached the discovery of the true nature of the flow of electrical energy.

The flow of electrical energy, represented by a Poynting vector, is interpreted that

electromagnetic waves carry it along a conductor.

This has been a far-fetched interpretation.

But this mechanism was clarified by the energy body theory.

The Lorentz force in the current generation process is complicated.

This is a combination of changes in the energy density of the magnetic field caused by the collision of electrons with the magnetic field and changes in the interaction between the rotating waves of electrons and the waves of the magnetic field.

The power generation side crossing the external magnetic field and the conductor side without the external magnetic field are considered.

### **Power generation side**

When the wire crosses an external static magnetic field (spreading waves of electrons while rotating), the energy of the magnetic field in front of the electrons increases and the energy of the magnetic field behind the electrons decreases, relative to each other.

As a result, the electrons receive backward attractive forces.

At the same time, depending on the external magnetic field and the direction of the electron's rotating waves, the attractive and repulsive forces that occur equally on the left and right sides of the electrons become made different in magnitude by the movement of the electrons. Thus, rotational torque is produced, and the electrons rotate.

### **Conductor side**

Like rippling water molecules, electrons rotate and drag neighboring electrons around, propagating electrical energy. Also, it's like a gear. This is the mechanism for transmitting electrical energy and is the actual state of the Poynting vector.

## **X57.2. Generator similar to water molecules in waves and rotating of electrons in a conductor.**

**First, we will explain diagram Fig.X58-1 B, which generates a current.**

**B1:** The magnetic field is directed from the back to the front. When the conductor is moved downward across this magnetic field, the magnetic field received by the conductor becomes relatively dense at the bottom of the conductor and sparse at the top. Therefore, the electrons are attracted to the upper side where the energy of the magnetic field is lower and move. At this time, there are two possible electron postures: one in which the axis of movement is upward, and one in which the axis of movement is downward. All electrons that have other postures can be concentrated into these two postures. Now, let's consider the posture that the electrons in these two types of postures take as they move upward. In other

words, since the directions of rotating electron waves are opposite on the left and right sides, the question is whether they are pulled from the side that rotates in the same direction as the magnetic field or from the side that rotates in the opposite direction to the magnetic field. If an electron approaches a magnetic field from outside the field, it should be attracted from the wave side that rotates in the same direction as the magnetic field. However, when placed in a uniform magnetic field, it cannot be determined which side it is attracted. This is because if the magnetic fields are equal, the attractive force (in the same direction to the magnetic field) and the repulsive force (in the opposite direction to the magnetic field) are equal on both sides of the rotating electron wave. However, when the conductor is pulled downward, the balance is disrupted. As shown in the figure. This generates rotational torque in the electrons. Then, it heads upwards while drawing an arcuate trajectory. The force that causes these electrons to rotate and move upward is the Lorentz force.

At this time, the electrons are polarized in a direction perpendicular to the conductor, so the rotating wave moves away from the electric field and becomes perpendicular. This is the magnetic field created around the current. The direction of current flow is determined by the direction of rotation of this magnetic field. (Note: In electromagnetism, other directions are determined based on the direction of the current, but in energy body theory, the direction of the current is determined by the direction of the magnetic field.)

**B2:** The opposite of B1. The electrons move downward, and the direction of the current is opposite to B1.

**Next, I will explain Fig.X57.2-1 A.**

At **A**, the force that moves the electrons in the conductor is not applied from anywhere outside, other than the energy generated at **B**. The electrical energy generated at **B** propagates and moves the electrons at **A**. In other words, the electrons at **A** are moving in the same way as at **B**, even though there is no external energy. It is generally understood that energy is transferred by moving electrons, but this is incorrect. Electrons, which become electric current, move at a very slow speed. Therefore, there is a theory that electromagnetic waves carry electrical energy through the surface of the conductor or through the external space, but this is not clear. The mystery has been elucidated using the energy body theory, but this discovery completes the process. In **B**, the kinetic energy applied from the outside was changed into kinetic energy that draws the electron in a circular arc due to the Lorentz force. The kinetic energy of this electron in its circular arc propagated to the electron in **A**. What is very interesting here is that the electrons in **B**, which were classified into two types with their propagation axes pointing upward and downward, rotated clockwise and counterclockwise. If you line up electrons rotating to the right and rotating to the left, they

will move in the same direction. Even if only one electron has rotational energy and the other does not, the electron that does not have rotational energy will also rotate due to the rotational energy of the electron that has rotational energy. It's just like a row of gears meshing, rotating, and transmitting energy. If the directions of the rotating waves of both electrons are A1, both are directed toward the back. Therefore, the speed of both waves increases, the energy decreases, an attractive force acts, and the waves are distorted and dragged at the distortion angle  $\theta$ . Electrical energy is then propagated through the distortion angle and rotational energy.

Lorentz force generated on a charged particle moving in a magnetic field

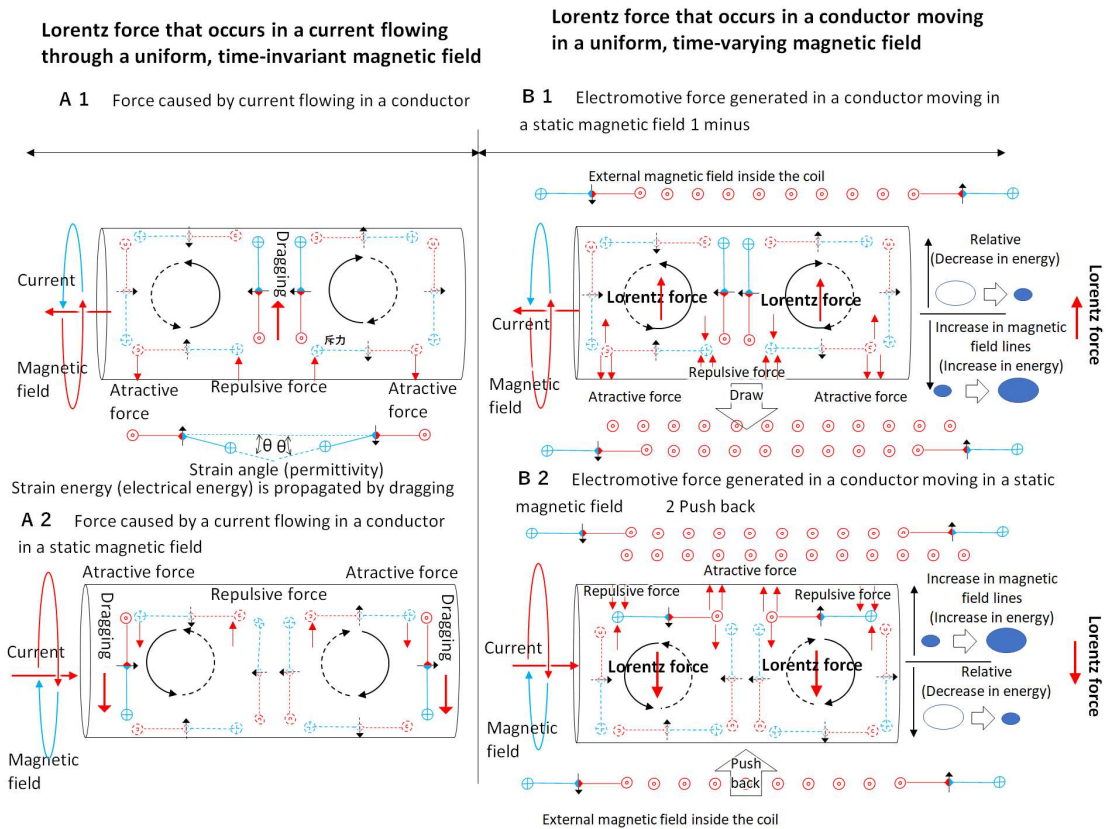


Fig.X57.2-1

When A1 and A2 in Fig.X57.2-1 are made continuous, the rotational motion of the electrons that draws a semicircular arc upward and downward becomes the continuous circular motion in Fig.X57.2-2 C. When two types of rotating electrons, one rotating to the right and the other rotating to the left, are placed side by side, energy is transmitted as if gears were lined up. This current is an alternating current.

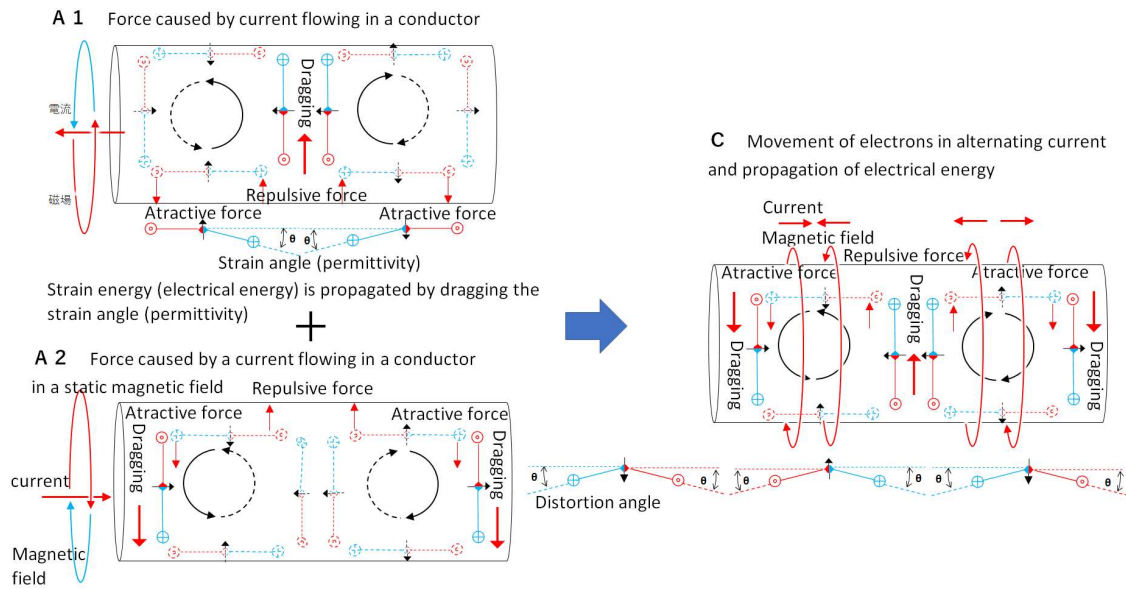


Fig.X57.2-2

If we make the conductor through which this alternating current flows a little longer, as shown in Fig.X57.2- 3, we can clearly see the changes in the circular motion and drag direction of the electrons' posture, the generation of distortion angles associated with this, and the propagation of electrical energy. When current flows, the electrons in the wire rotate in a circular orbit. This rotation includes right rotation and left rotation. The electron next to the electron rotating clockwise will rotate counterclockwise due to drag. The electron next to it rotates clockwise due to drag. In this way, the rotational motion of the electrons propagates and becomes an electric current. It's just like a lot of gears meshing, rotating, and transmitting energy. However, there are some differences. In the case of gears, energy is conserved throughout the gear mechanism, but in the case of electron dragging, the energy held by the dragging electron is lost when it propagates to the dragged electron. The energy possessed by electrons is conserved by the distortion expressed by the distortion angle. This distortion angle is the permittivity, and the speed of light and Planck's constant are within this distortion angle. Drag occurs when the directions of the rotating waves of electrons, which are opposite to each other on the left and right sides, are the same.

If the direction of the rotating wave of an electron's one side is facing towards the back, the other electron's one is also facing towards the back, and if one side is facing towards the hand, the other side is also facing towards the hand.

This is because when the waves are in the same direction, the speed of the waves increases, the energy locally decreases, and an attractive force acts.



### C Movement of electrons in alternating current and propagation of electrical energy

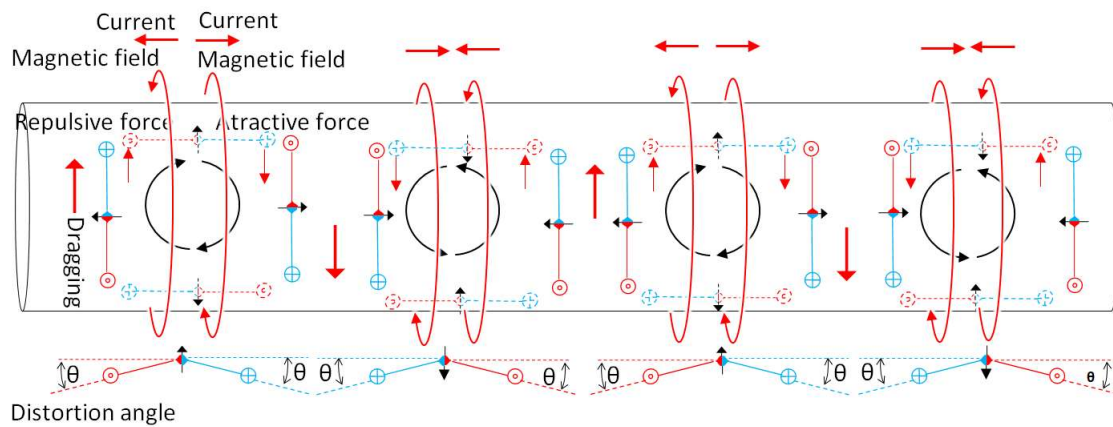


Fig.X57.2-3

#### X57.3. Reason for speed of current

Electric current is generally understood to be the movement of electrons from the cathode to the anode.

In fact, the speed of electrons is slower than that of a snail.

However, electrical energy travels at the speed of light.

Some explanations include that information is carried by electromagnetic waves, which also move distant electrons almost simultaneously, thereby carrying electrical energy.

But they all have flaws.

The energy body theory revealed that electrical energy stored as the distortion angle of the spreading foot of rotating waves of electrons is propagated one after another by the drag of the turning electrons.

The distortion angle of a single electron is the restoring force of the electromagnetic interaction and the conserved electrical energy.

Also, the ratio created by the distortion angle is the speed of light.

If you add up the distortion of individual electrons along the wire, the speed of light is reached over the entire length of the wire.

This satisfies the conditions that the movement of electrons is at the speed of a turtle and the propagation of electrical energy is at the speed of light.

Moreover, the propagation of electrical energy is in the form of waves.

By considering the electrical energy carried along a conductive wire, I clarified the relationship between the flow of electrical energy, the permittivity of vacuum, the magnetic permeability of the vacuum, and the speed of light.



Current is thought to flow at the speed of light, but the electrons that are the main components of current have a very slow drift speed. In fact, it is not clear exactly how electrical energy is transported. However, according to the equation representing the flow of electrical energy called the Poynting vector  $S = E \times H$ , the direction of vibration of the electric field and the direction of vibration of the magnetic field are perpendicular, and the flow of electrical energy density is in the direction perpendicular to the electric and magnetic fields. I know. The most popular theory is that electromagnetic waves around the conductor provide information to the electrons in the conductor and cause them to move. When I consider this using an electron model based on energy body theory, I find that the distortion that occurs in the spreading foot of electrons conserves electrical energy and propagates electrical energy by dragging neighboring electrons with it as it rotates, became clear. It was also revealed that the distortion angle of the electron foot forms a triangle determined by the vacuum permittivity  $\epsilon_0$  and the vacuum permeability  $\mu_0$ . The triangle formed by the foot of photons that share this distortion angle is similar to the triangle formed by the permittivity of the vacuum  $\epsilon_0$  and the magnetic permeability of the vacuum  $\mu_0$ . In other words, it has become clear why the permittivity of vacuum  $\epsilon_0$  and the magnetic permeability of vacuum  $\mu_0$  are the speed of light. This distorted angle of the photon's foot provides a reason for "the principle of the constant speed of light" of the special theory of relativity, which is accepted without knowing the reason.

In electromagnetism, electric current is explained as the movement of charges (electrons) from the cathode to the anode. The speed of current is thought to be the speed of light. However, the speed of the electrons is known as the drift speed, which is slower than that of a snail. Therefore, cutting-edge research believes that electromagnetic waves around conductive wires carry information and electrical energy, and that individual electrons that receive the information move almost simultaneously. However, it is difficult to say that this is a completely convincing interpretation.

When I considered this using the electron model of energy body theory, I came to the following conclusion that had never been considered before.

Fig.X57.3 shows how a rotating electron drags its neighbor and propagates the electrical energy stored in the distortion. (\*Please refer to a separate article for the reason why electrons behave like this.)

The reason why electrons drag neighboring electrons is that when the directions of their rotating waves are the same, there is an attractive force (when they are opposite, there is a repulsive force). This is because when the waves advance in the same direction, the energy at the contact point decreases. Therefore, the dragging directions are alternately opposite as

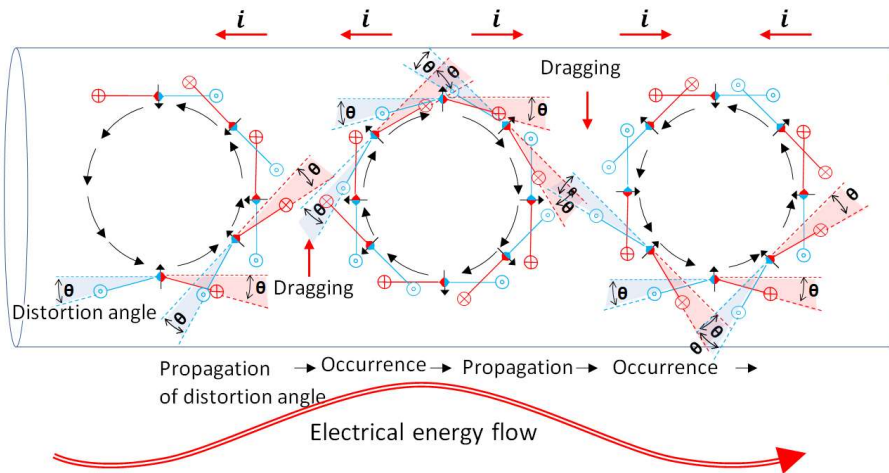
shown in Fig.X57.2-3.

- When the electrons are parallel to the conductor, the rotating waves of the electrons cancel each other out. (Neutralization of electric field)
- When the electrons are perpendicular to the wire, rotating waves of electrons appear around the wire as a magnetic field.

Applying Fleming's right-hand rule to the direction of the magnetic field created around the conductor will give the direction of the current. (Paradoxical from the perspective of electromagnetism) As can be seen from Fig.X57.3, the directions of the currents alternate in opposite directions. However, as can be seen from Fig.X57.3, electrical energy is transported by propagating distortion restoration energy. This distortion is transferred not every rotation of the electrons, but every half rotation. Therefore, electrical energy flows in one direction and does not alternate in opposite directions. This was another discovery that exceeded my expectations.

- Although the current (the rotational direction of the magnetic field around the conductor) changes in the opposite direction in one cycle, "electrical energy flows in one direction."

Electron swirl and distortion angle propagation in a conductor through which alternating current flows



1. When the waves are in the same direction, an attractive force occurs, dragging nearby electrons and propagating the swirl.
2. The rotating wave of the electron on the dragging side propagates the distortion angle that conserves electrical energy to the electron on the dragged side. The electrons on the side being dragged are distorted at the distortion angle and conserve electrical energy. .

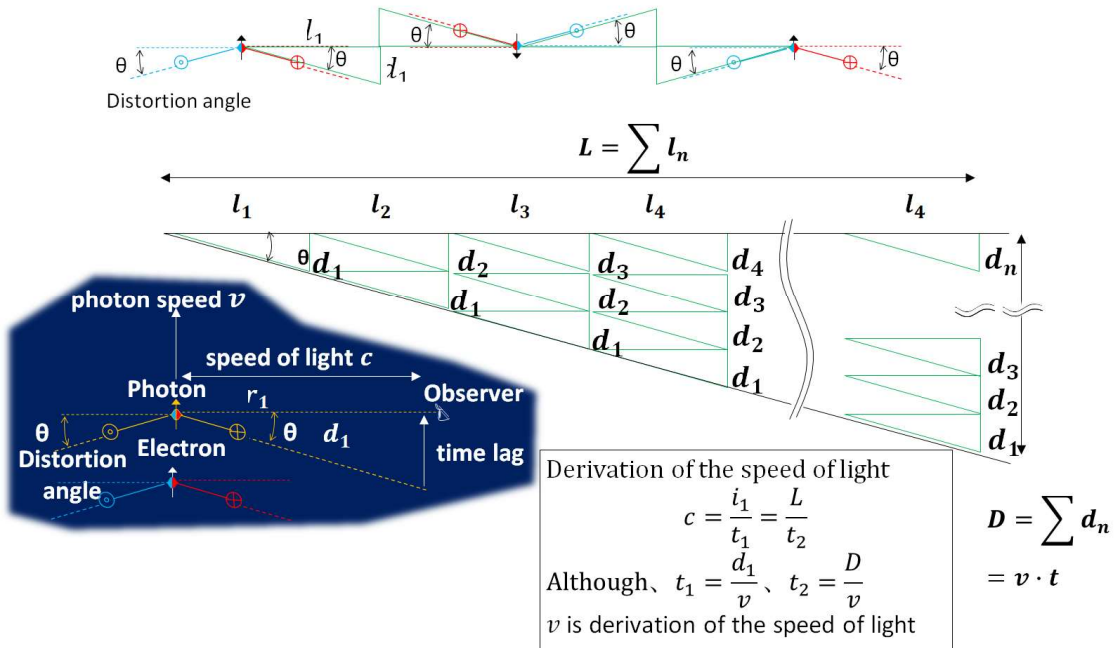


Fig.X57.3

#### X57.4. Relationship between speed of light, permittivity, and speed of current

Here too, we must first begin by explaining what the speed of light is. For this purpose, we will briefly explain the photon model. Kinetic energy is required for electrons to move.

Kinetic energy is a wave in space created in front of an electron. It reflects the shape and distortion of the electron's foot and drags the electron. This kinetic energy is separated from the electron and becomes a photon. Therefore, the photon inherits the inertial motion and distortion angle of the electron just before separation. In other words, apart from the "speed of light" there is the "speed of photons". The "velocity of a photon" is the velocity of inertial motion of an electron just before separation. The "speed of light" relies on a different principle from the speed we normally use.

- The "principle of the constant speed of light" is the principle that the speed of light in vacuum always takes a constant value, regardless of the movement of the light source, from the perspective of all observers who are moving at the same speed relative to each other.

The reason why this principle holds true remains unknown. However, by using the photon model of the energy body theory, it is possible to explain why "the principle of the constant speed of light" holds true. The secret is the "distorted angle". Before that, there are things you need to know. We sense light because we observe the spread of photons from the side, in a direction perpendicular to the direction in which photons travel. This is why the distortion angle has meaning. From the moment a photon separates from an electron until it reaches the observer, there is a delay in the distortion angle. This delay is 300,000km/sec. See FigX.25. The triangle formed by this delay and distortion angle is naturally similar to the triangle formed by the permittivity of vacuum and the magnetic permeability of vacuum. By the way, even if the restoration speed of the distortion angle of microscopic electron spread is the speed of light, the spread of the foot of one electron is in the microscopic range. Will it travel tens of thousands of kilometers at the speed of light like light? It arrives at the speed of light. The microscopic triangles created by the microscopic electron distortion angles due to the permittivity of the vacuum and the magnetic permeability of the vacuum become a gigantic triangle created at a speed of 300,000 km/s when you add up an infinite number of microscopic triangles. In other words, even micro electrons can propagate far at the speed of light by adding up the propagation of distortion from countless electrons. The lower diagram in Fig.X57.3 explains this.

So, what do the distortion width, distortion angle  $\theta$ , vacuum permittivity  $\epsilon_0$ , and vacuum permeability  $\mu_0$  mean? The vacuum permittivity  $\epsilon_0$  was introduced as a proportionality constant to express the electric field strength  $E$  obtained by Coulomb's law as the electric flux density  $D$ . The magnetic permeability  $\mu_0$  of vacuum is considered to be a meaningless value. Fig.X57.4 shows the relationships among distortion width, distortion angle  $\theta$ , vacuum permittivity  $\epsilon_0$ , and vacuum magnetic permeability  $\mu_0$ .

We can draw exactly the same diagram for the distortion of the photon's foot as for the electron. However, since photons are waves, the speed in the x-axis direction represents the speed of light as shown in the following equation.

Note that the speed of light  $c$  is the speed obtained by dividing the time required to eliminate the distortion width by the distance in the x-axis direction. This is because humans perceive the photon's spreading foot from the side (x-axis direction) and perceive it as light. In other words, light is observed from a direction perpendicular to the direction in which photons travel.

When the distortion width is expressed by setting the XY axes, the function of the distortion width is directly proportional and becomes the following equation.

$$y = kx = \frac{1}{\sqrt{4\pi\epsilon_0}} \cdot x = \frac{\sqrt{10^{-7}}}{\sqrt{4\pi \times 10^{-7} \cdot \epsilon_0}} \cdot x = \frac{\sqrt{10^{-7}}}{\sqrt{\mu_0\epsilon_0}} \cdot x = \sqrt{10^{-7}} \cdot c \cdot x$$

However,  $k$  is Coulomb's constant.

$$\therefore c = \frac{1}{\sqrt{10^{-7}}} \cdot \frac{y}{x}$$

Restoration force of the rotating wave foot of electrons, Coulomb constant, and speed of light

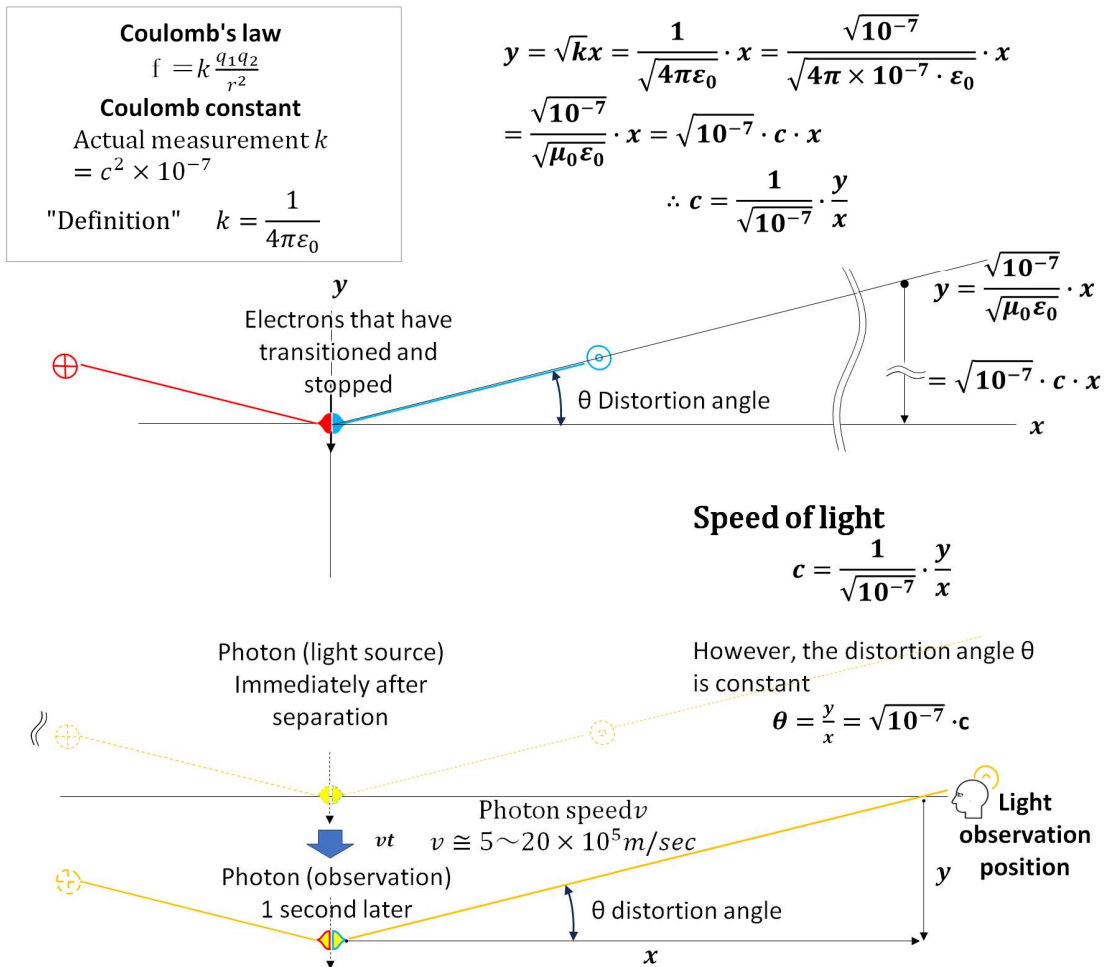


Fig.X57.4

It was unclear how electrical energy is transported, but with this discovery, it became clear that electrical energy is stored as distortion in the broadening of the electron's foot, and as the electron rotates, it drags neighboring electrons and increases the distortion. It was also found that the distortion angle of the electron foot, which occurs as a result of electromagnetic interaction between the electron's foot, is expressed by the permittivity of vacuum and the magnetic permeability of vacuum.

### X58. Current electron portion and Cooper pair

In the BCS theory that explains superconductivity, two electrons with antiparallel spins form a weak bond called a Cooper pair. It is thought that superconductivity occurs when the wave functions of Cooper pairs align in phase and many Cooper pairs move simultaneously

as boson particles.

## Electron pairs in energy body theory (bosonization)

When the spins are parallel    When the spin is antiparallel



$$\text{Synthetic spin} = \frac{\hbar}{2} + \frac{\hbar}{2} = \hbar \quad \text{synthetic spin} = \frac{\hbar}{2} - \frac{\hbar}{2} = 0$$

- ✖1. When the spins are antiparallel, the relationship is electron-positron (annihilation).
- 2. In the case of superconductivity, the spins are antiparallel.

Fig.X58-1

The motion of electrons in the current model of energy body theory resembles this large number of Cooper pairs.

Near absolute zero, the spreading foot of the rotating waves of electrons becomes extremely narrow, and the diameter of the turn becomes small, making it difficult for electromagnetic interaction to take place. For this reason, the character of superconductivity appears.



## Temperature variation of electrons turn and propagation of distortion angle in a conductor carrying alternating current

electrons turn and propagation of distortion angle in a conductor carrying alternating current

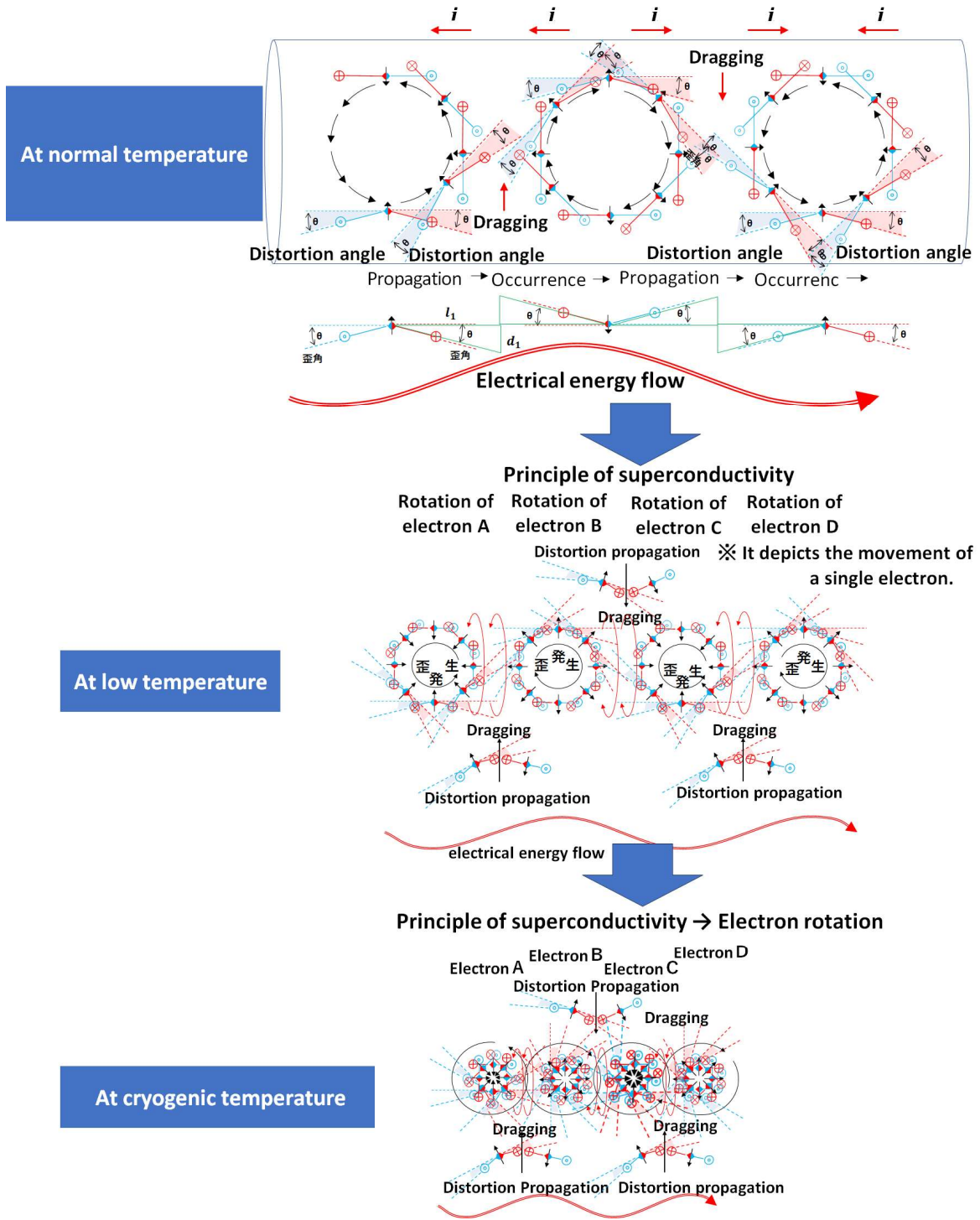


Fig.X58-2

**X59. The reason why electrons and protons have the same elementary charge**

It is difficult to explain why electrons and protons have electric charges.

Although the mass of a proton is about 1,836 times that of an electron, the absolute value of the elementary charge of each electron and proton is exactly the same,  $e$ .

The energy body theory revealed that the reason why electrons and protons have electric charges is due to the restoring energy of the distortion in their feet caused by the mutual interaction of their rotating waves.

The reason why electrons and protons have the same absolute value of elementary charge is that the restoration energy A of the distortion at the foot of the electron's rotating wave caused by interaction and the restoration energy B of the distortion at the base of the proton's rotating wave are the same.

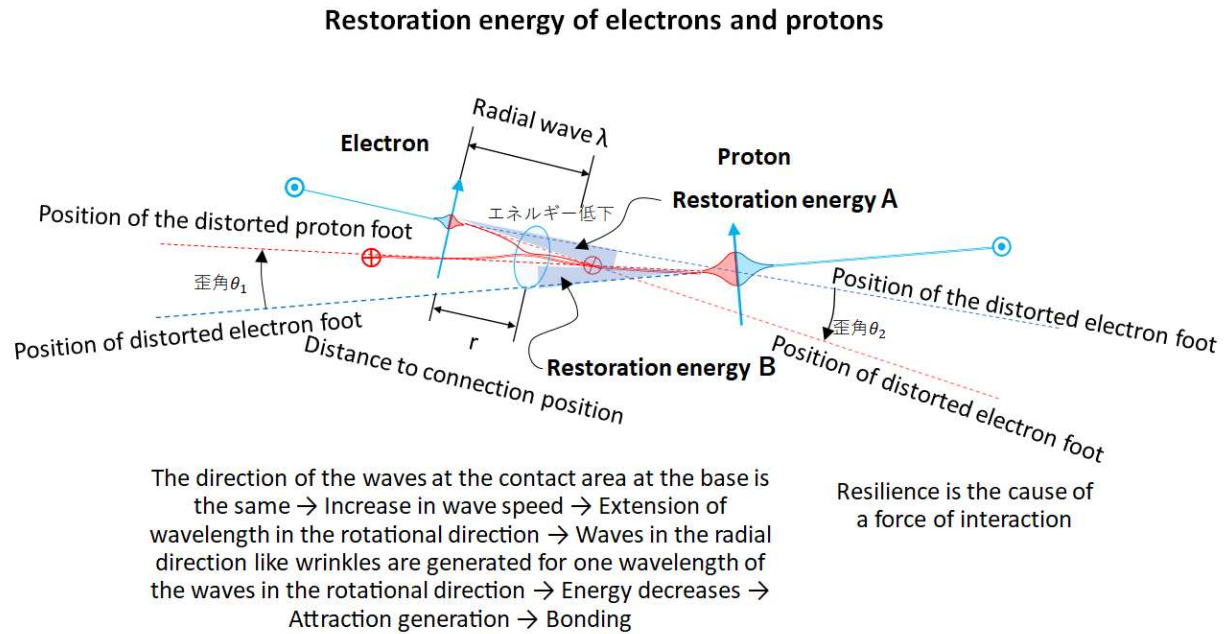


Fig.X59

**X60. Planck's constant in the distortion of the foot of electron's rotating wave**

Discrete energy levels discovered from the spectrum of hydrogen atoms was the beginning of quantum mechanics.

If we look at the discrete energy levels using energy body theory, we can see the reason why energy in the atomic nucleus becomes the discrete energy levels. Because dividing distortion width with distance is constant  $h$  on the distortion angle of the foot of the rotating wave of an electron.

The reason for the Pauli exclusion law is that if two or more electrons are in the same orbit, their feet will touch each other due to their posture.

Discrete energy due to the bonding distance between protons and electrons in the atomic nucleus and the distortion at the foot of the rotating waves (restoration energy)

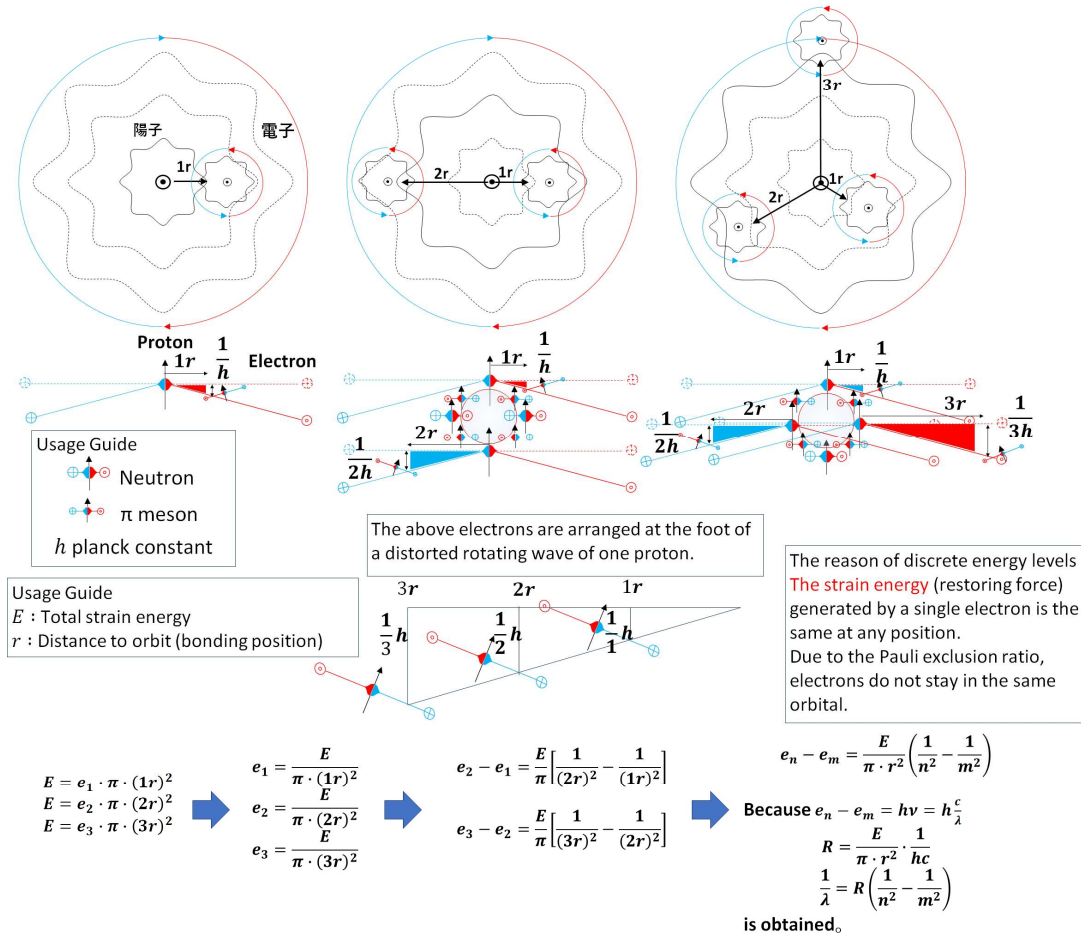


Fig.X60

### X61. Reason for spin magnetic moment and half-integer

An electron in an external uniform magnetic field will have a horizontal attractive force or repulsive force to the left of the electron (and vice versa to the right), depending on the direction of the magnetic field (the foot of the electron's rotating wave) and the direction of the electron's wave.

However, in an inhomogeneous magnetic field, an upward or downward attractive or repulsive force acts on the right or left side of the electron.

Therefore, only one side of the magnetic moment is subjected to an upward(or downward), attractive (or repulsive) force.

This is the reason why the spin becomes  $1/2h$ .

Incidentally, up, or down of the spin is considered to be an inherent property of elementary particles, but this is not the case.

Caution must be taken.

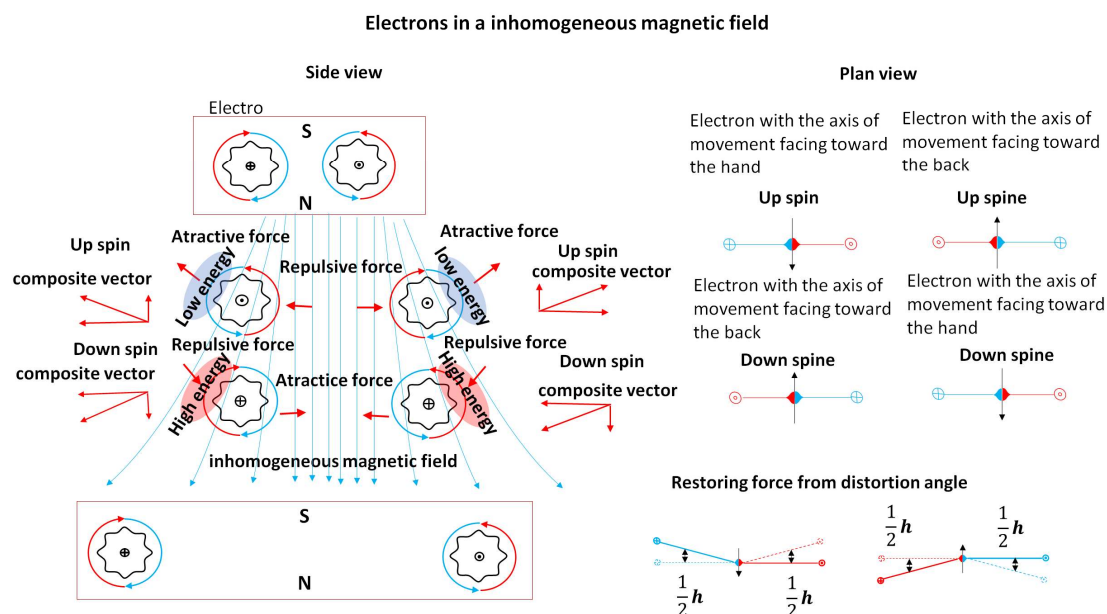


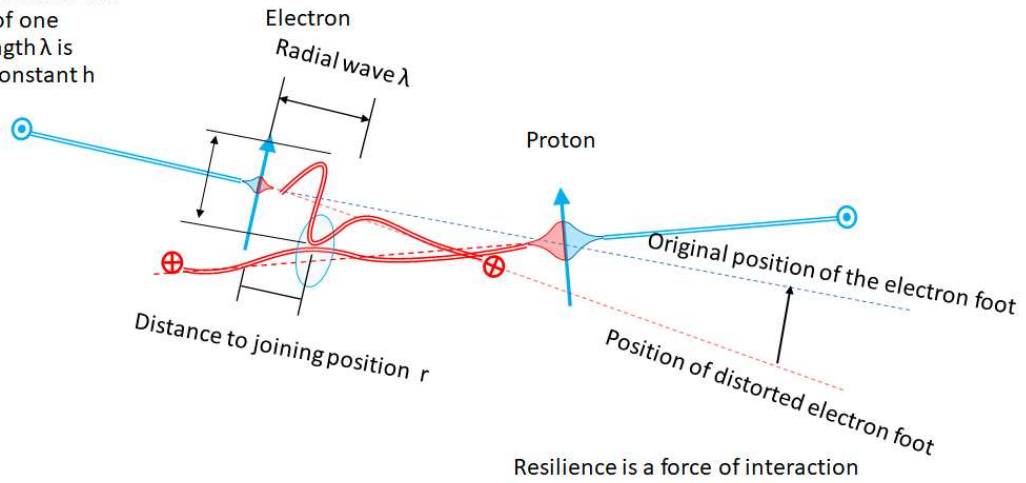
Fig.X61

### X62. Distortion of electron foot and Coulomb constant

The Coulomb constant expresses the restoring force of the distorted foot of the rotating wave of the electromagnetically interacting electrons (and the protons as well).

### Coupling of radial waves and electrons/protons

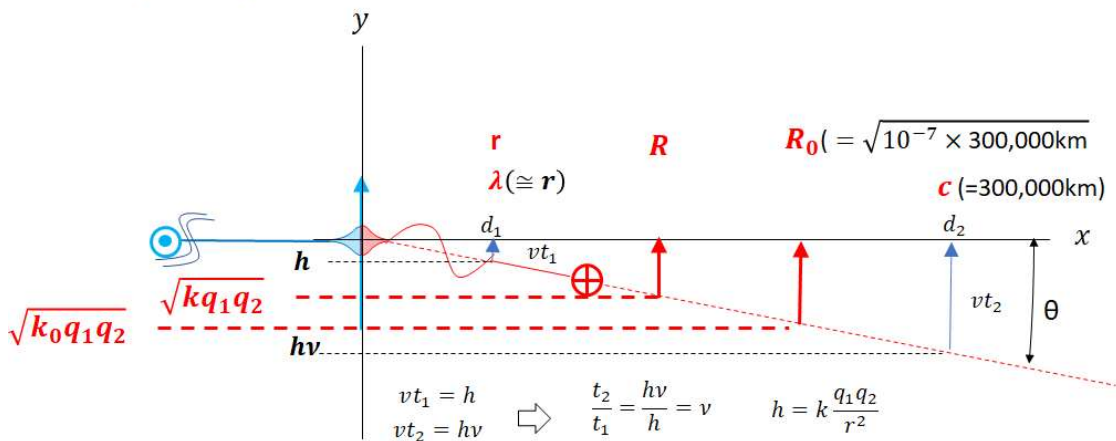
When the amplitude reaches its limit the energy of one wavelength  $\lambda$  is Planck constant  $h$



The directions of the waves at the contact area at the foot are the same  $\rightarrow$  Increase in wave velocity  $\rightarrow$  Extension of wavelength in the rotational direction  $\rightarrow$  Waves in the radial direction are generated for one wavelength of the waves in the rotational direction  $\rightarrow$  Energy decrease  $\rightarrow$  Attractive force generation  $\rightarrow$  Coupling

FigX62-1

### Magnitude of electron foot distortion and Relationship between the magnitude of distortion in the electron foot and the bonding position $r$ , wavelength of light $\lambda$ , speed of light $c$ , Planck's constant, and Coulomb's constant



FigX62-2

### Restoring force of the distortion at the foot of the electron's rotating wave

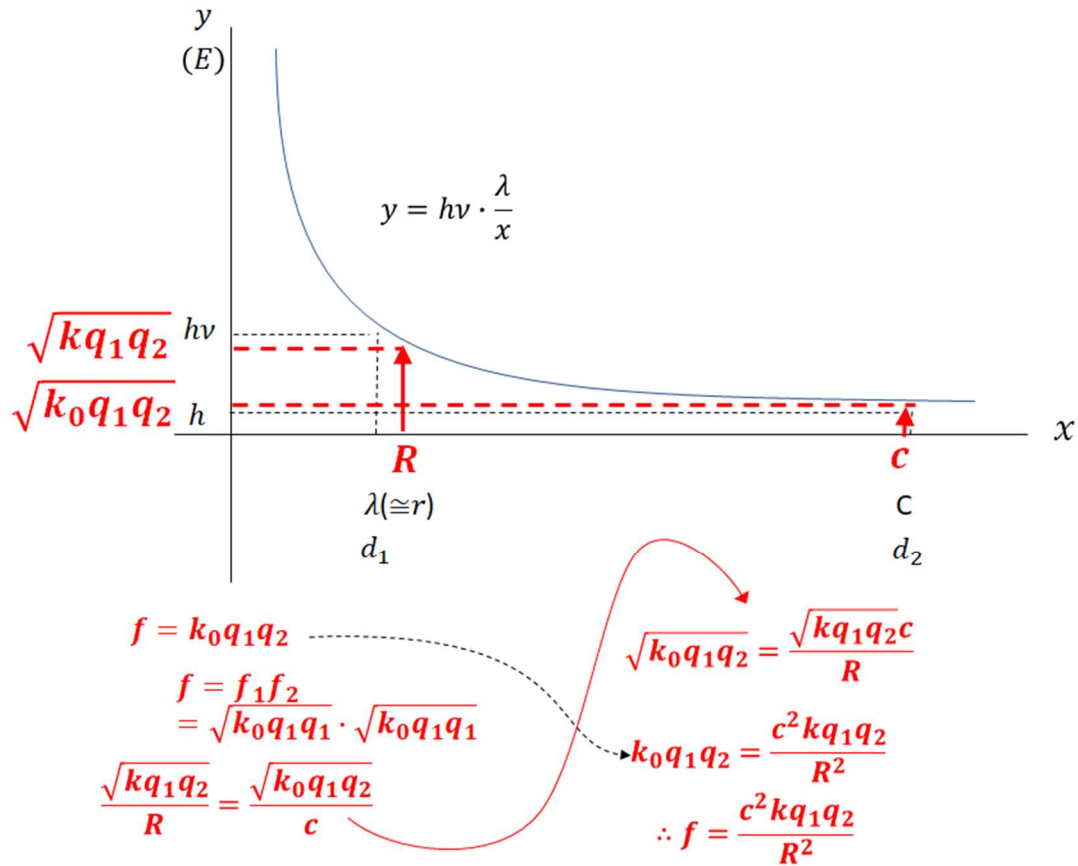


Fig.X62-3

Planck's constant, which is a fundamental number in quantum mechanics, also represents the restoring force from the distortion at the foot of the rotating wave of electrons (same as protons) that have electromagnetically interacted with each other.

So, I calculated Planck's constant  $h$ , which is a fundamental number of quantum mechanics, from Coulomb's law. The results are almost as expected.

Coulomb's law is as follows.

$$F = k \frac{q_1q_2}{r^2}$$

$k$  is Coulomb's constant,  $9 \times 10^9$ ,  $r$  is the distance between charges.

Based on Coulomb's law, the following equation can be obtained from Figure 4.

$$h = k \frac{q_1q_2}{r^2}$$



Originally,  $r$  is the distance from the center of the electron to the connection part, but since it is unknown, it is approximated by  $\lambda$ .

Also,  $q_1 q_2$  are the charges of the same electron.

$$h \cong k \frac{q_1 q_2}{\lambda^2}$$

Calculate based on the numerical value of the hydrogen atom.

$$k = 9 \times 10^9 N \cdot m^2 / C^2$$

$$\left(\frac{1}{\lambda}\right)^2 = \left[1.10 \times 10^7 \times \left(\frac{1}{1^2} - \frac{1}{2^2}\right)\right]^2 = (0.825 \times 10^7)^2 = 6.8 \times 10^{13} / m^2$$

$$q_1 q_2 = (1.6 \times 10^{-19})^2 C^2 = 2.56 \times 10^{-38} C^2 (eV^2)$$

$$h \cong 9 \times 10^9 \times 6.8 \times 10^{13} \times 2.56 \times 10^{-38} \cong 15.7 \times 10^{-15} N(C)$$

Note that  $\frac{1}{\lambda}$  is the following formula, and  $R$  is the Rydberg constant. For hydrogen atoms,  $n=1, m=2$

$$\frac{1}{\lambda} = R \left( \frac{1}{n^2} - \frac{1}{m^2} \right) -$$

Planck constant derived this time  $h \cong 15.7 \times 10^{-15} C$

Existing Planck constant  $h = 6.6 \times 10^{-34} J$

$$h = 4.1 \times 10^{-15} C$$

There is a difference of 4 times in the integer part, but this is thought to be because  $r$  in the formula is approximated by  $\lambda$ .



### X63. Antiparticle

Antiparticles have opposite charges only.

Properties other than charge remain the same.

It is strange that only the charges are reversed.

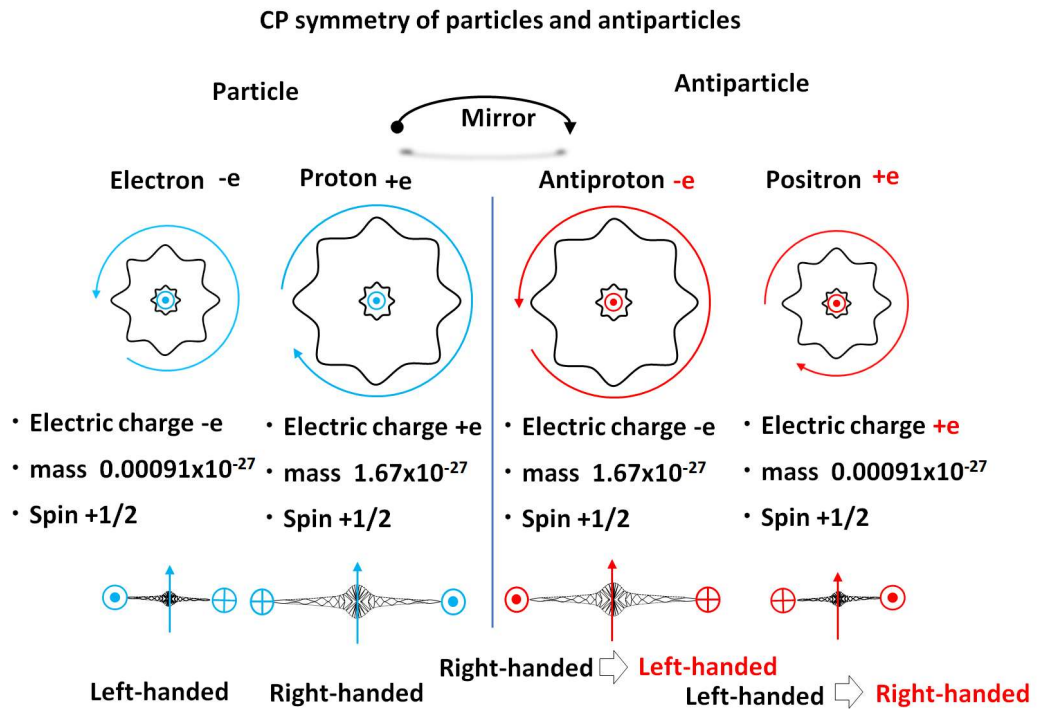
Since we cannot explain why elementary particles have electric charges, we cannot explain why they become antiparticles when their electric charges are reversed.

In the energy body theory model, electrons (protons) moving backwards are antiparticles.

Just reverse the axis of travel.

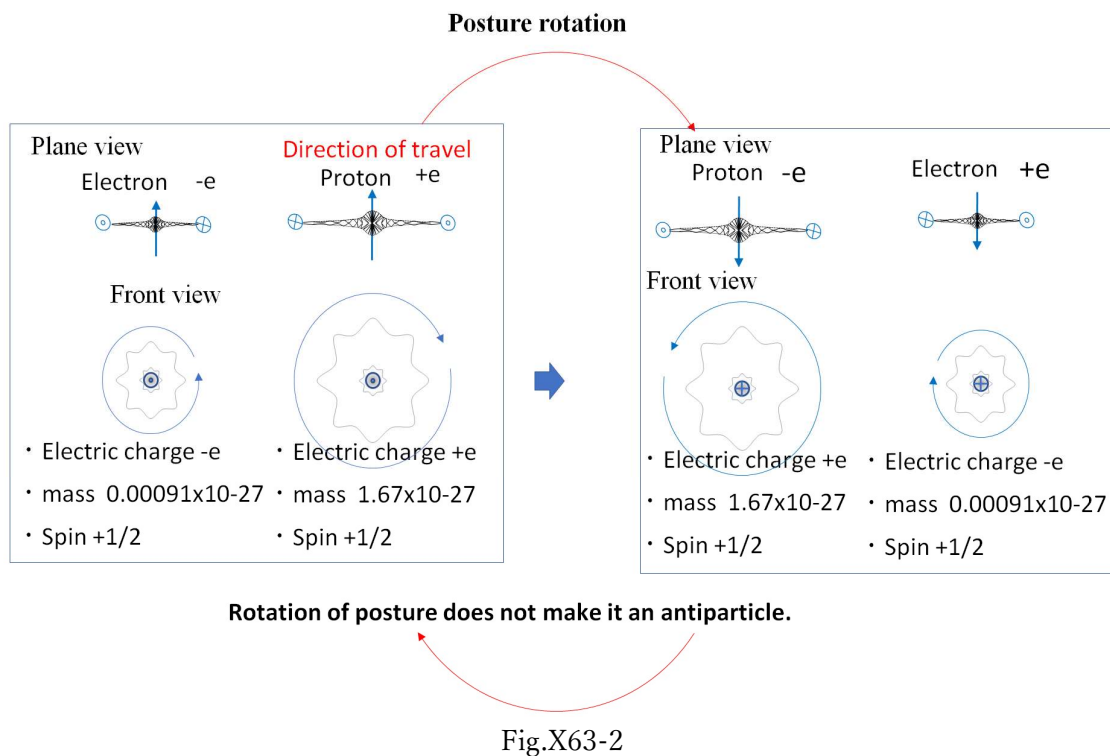
This causes the rotating waves of electrons or protons to rotate in the opposite direction, and only the charges are reversed.

A counterclockwise wave has a negative charge, and a clockwise wave has a positive charge.



The antiparticle on the right is the reversal of the proton and electron axes on the left. This is the state in which the protons and electrons on the left move backwards, so their traveling axes point in the direction of travel.

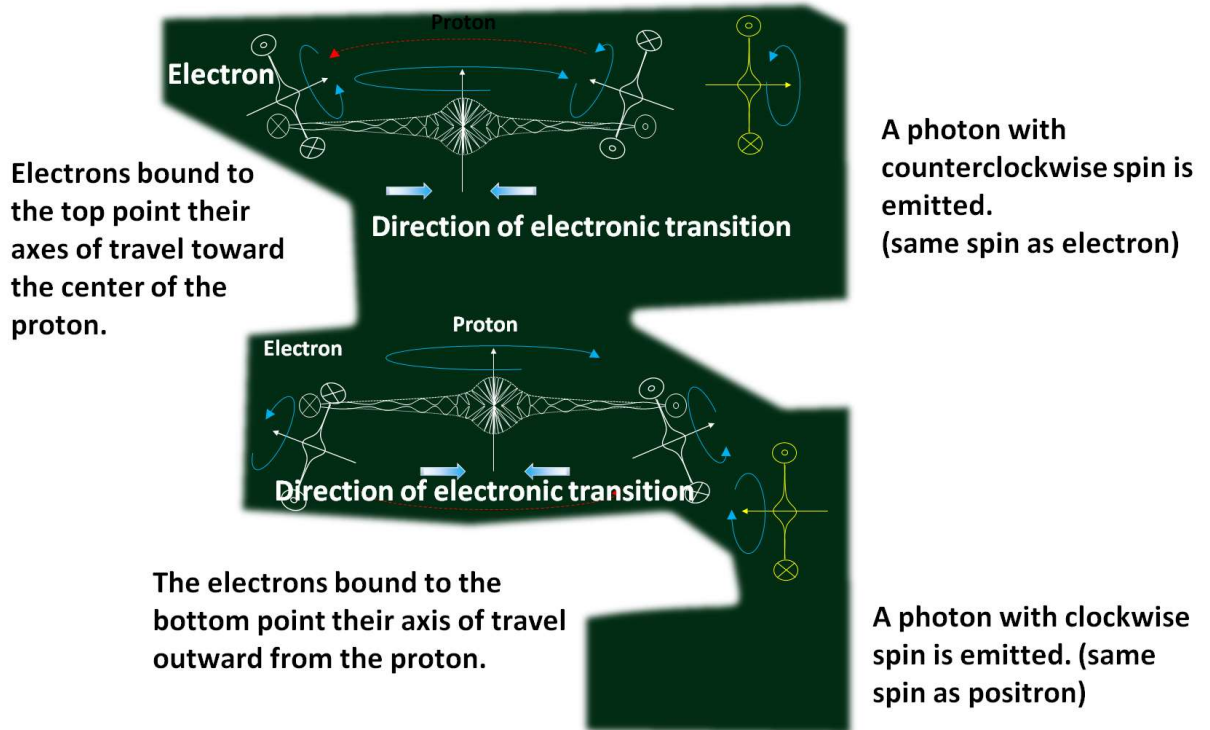
Fig.X63-1



#### X64. Electrons moving backwards

When an electron binds to the lower side of a proton's orbit and makes a transition, the rotating wave of the electron rotates in the opposite direction to the normal direction, so it becomes a positron. The spin of the photon emitted at this time also becomes the opposite direction. However, I haven't verified any examples.

## Attitude of an electron in the orbit of a proton



The transition of the electron bonded to the bottom side is backward, so it becomes a positron.

Fig.X64

### X65. Neutron formation

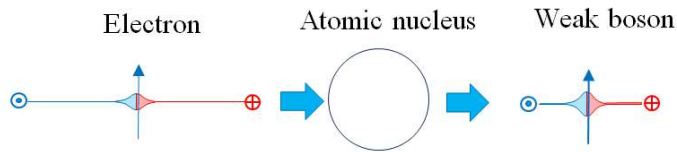
Electrons and protons naturally bond easily, but in the atomic nucleus, when an electron is pushed into a proton by the attraction of a proton and external pressure, a proton becomes a neutron.

At this time, the electron temporarily becomes a weak boson due to the pressure and energy of the nucleus.

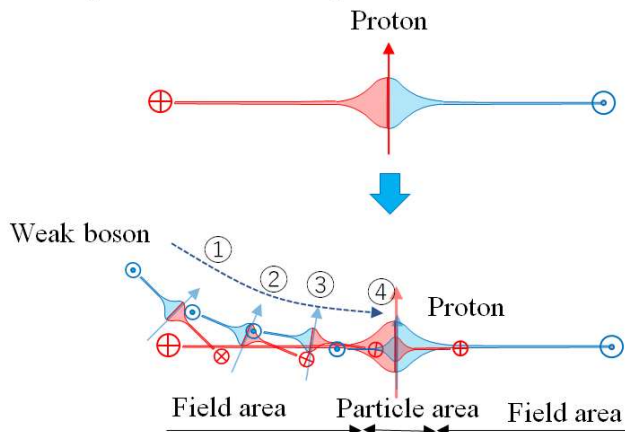
When an electron enters a proton's body, the proton's foot of rotating wave is neutralized and disappears, and there is no longer any electromagnetic interaction.

But protons are much larger than electrons, so, the proton's rotating waves remain. And the particle part interacts with the magnetic field.

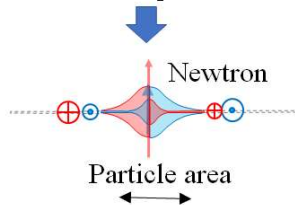
## Neutron formation



When an electron is sandwiched between protons and other particles within the atomic nucleus, the particle part becomes enlarged and the base part narrows, resulting in a weak boson.



The electron, which has changed into a weak boson, overcomes the repulsive force generated along the way due to the proton's attraction and external force and enters the proton.



The waves of weak bosons (electrons) and protons are rotating in opposite directions, so their foot are neutralized and annihilated. This creates a neutron that has no electromagnetic field. However, since the particle part maintains the right-handed rotation wave of the proton due to the difference in size, the magnetic property remains. This is why neutrons interact with magnetic fields.

Fig.X65

### X66. $\beta$ decay

#### X66.1 $\beta$ decay

The weak force is the force that causes beta decay, etc.

Beta decay is a phenomenon in which protons turn into neutrons and neutrons turn into protons within the nucleus of an atom.

You need to think in two steps.

1. Why is it enough to use weak force?
2. What is the mechanism by which weak force works?

#### **X66.2. Why is it enough to use weak force?-**

- **Change from a proton to a neutron**

An electron (a weak boson) in the orbit of a proton has an attractive force (wave direction is the same) toward the center of the proton.

On the other hand, when the rotating foot of the electron reaches the opposite side of the proton, a repulsive force (the direction of the wave is reversed) acts.

- **Change from a neutron to a proton.**

Therefore, when a pressure that exceeds the repulsive force is applied, the electron enters the proton's particle area.

Then, the foot of the proton's rotating wave is neutralized and disappears, becoming a neutron.

- **Change from a neutron to a proton.**

The forces acting on the electron in the proton is horizontally balanced.

On the other hand, there is no force acting in the vertical direction.

Therefore, if an electron moves vertically, it can be ejected from the proton with little force.

In other words, all that is required is the kinetic energy of the electron.

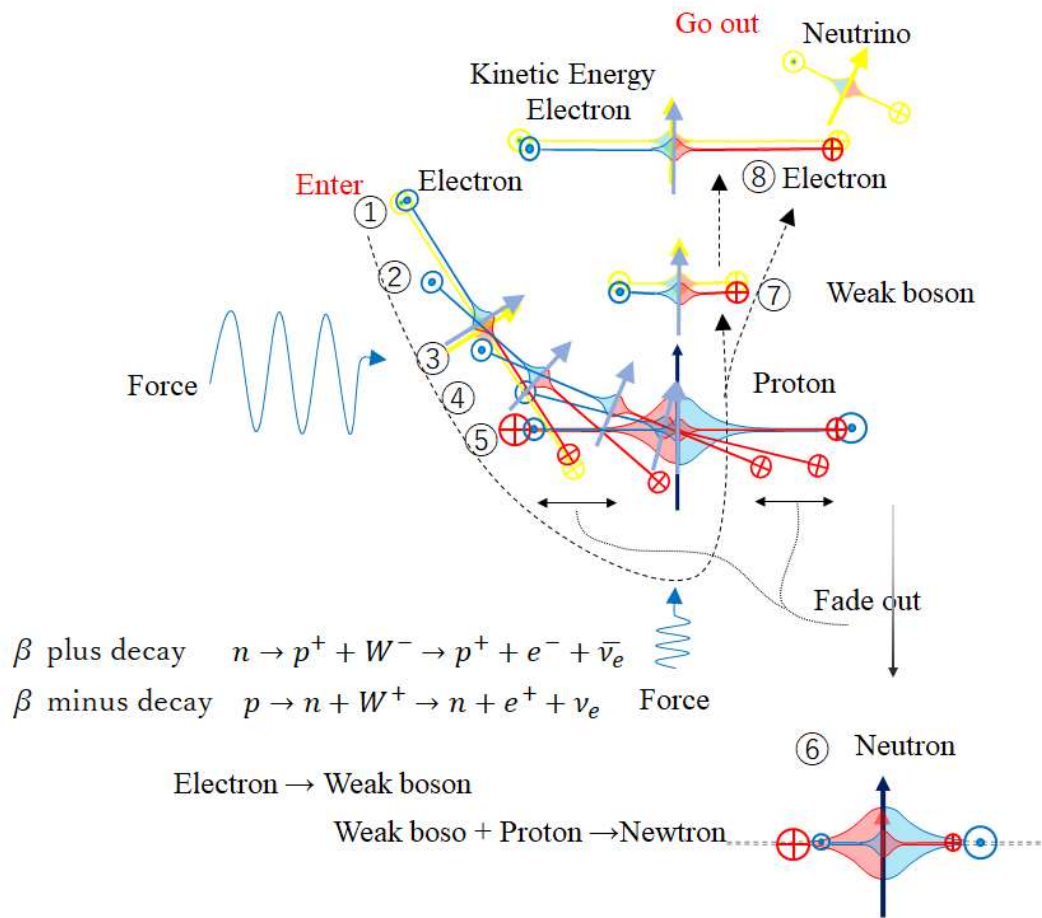


Fig.X66.2

### X66.3. Mechanism of weak force

Mechanism of weak force is the energy level in the nucleus.

If the energy in the nucleus is low, it will generally be beta-minus decay.

If the energy in the nucleus is high, it will generally be beta-plus decay.

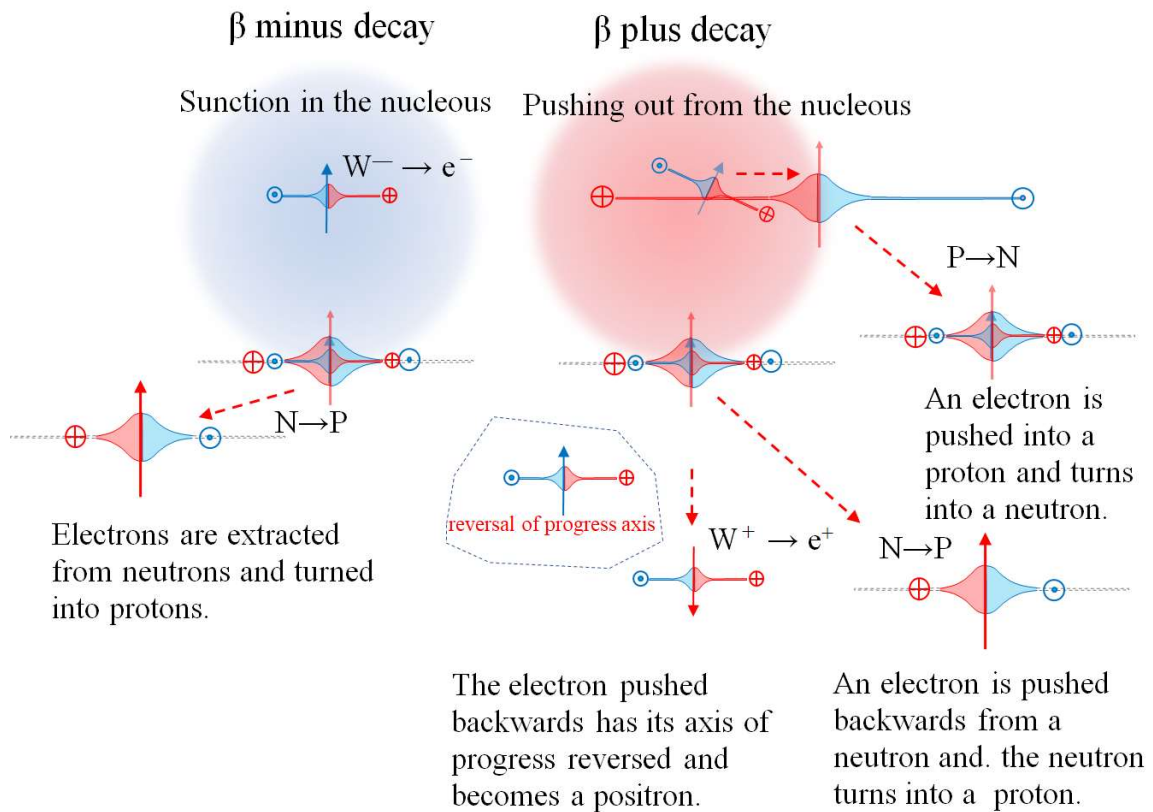


Fig.X66.3

**X66.4.  $\beta$  minus decay**

When the energy in the atomic nucleus is low, weak bosons (deformation of electrons) are sucked out from "neutrons whose Progress axis is directed toward the center of the nucleus", and the neutrons turn into protons.

The weak boson leaves the proton in the vertical direction, so a weak force is sufficient.

Then, neutrons turn into protons.

The weak boson that is sucked out returns to an electron and exits the nucleus.

The kinetic energy that was dragging the weak boson becomes a neutrino (or a photon in the foot of an electron).

Note that because the weak boson does not have a rotating wave foot (field), it is difficult for it to interact electromagnetically.



# $\beta$ minus decay

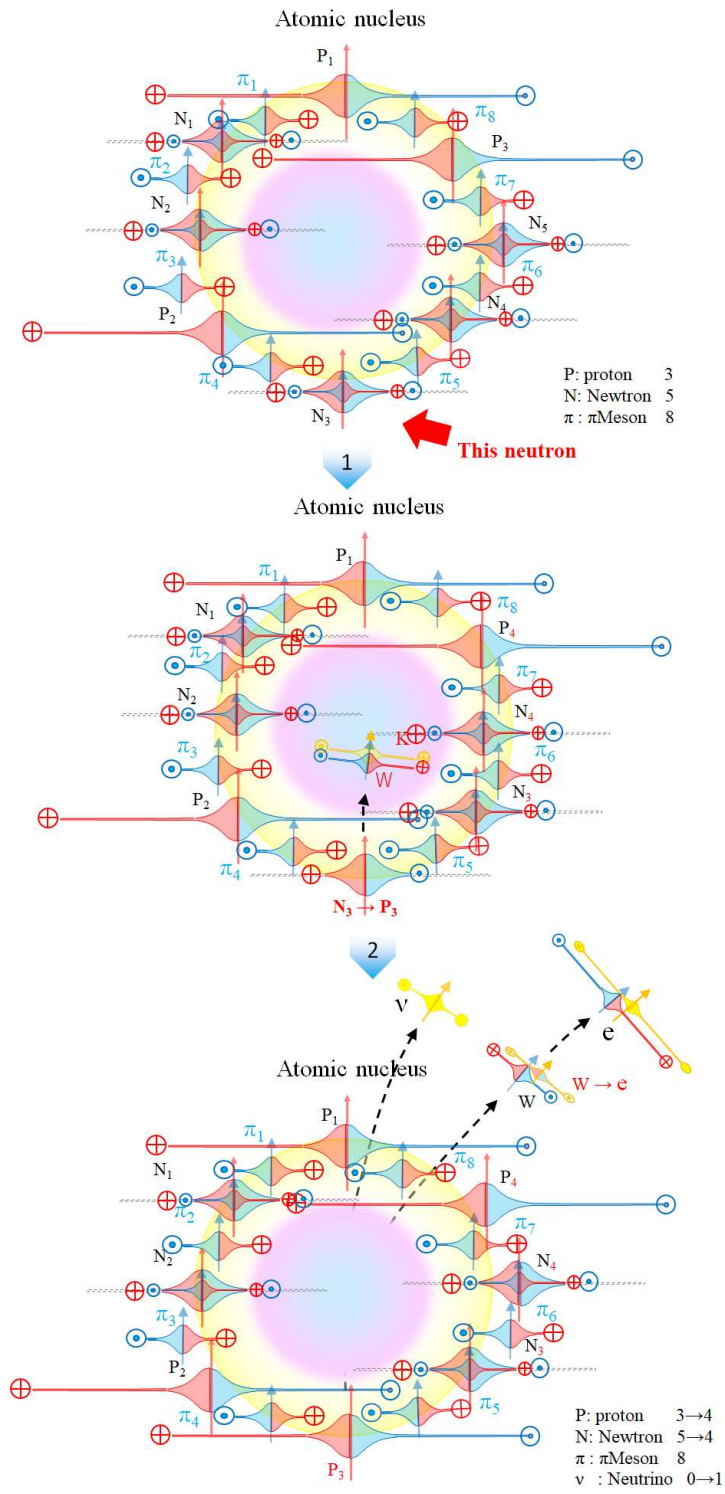


Fig.X66.4

### **X66.5. $\beta$ plus decay**

If the energy in the nucleus is high,

Weak bosons are extruded vertically from "neutrons whose Progress axis is toward the center of the nucleus", and the neutrons turn into protons.

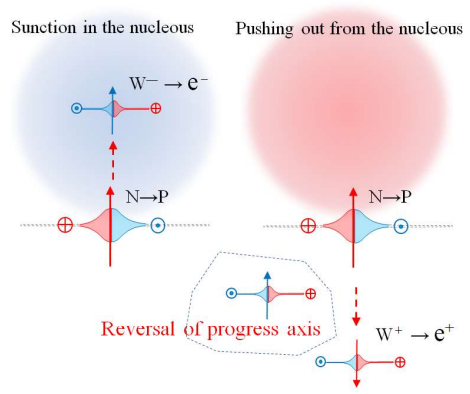
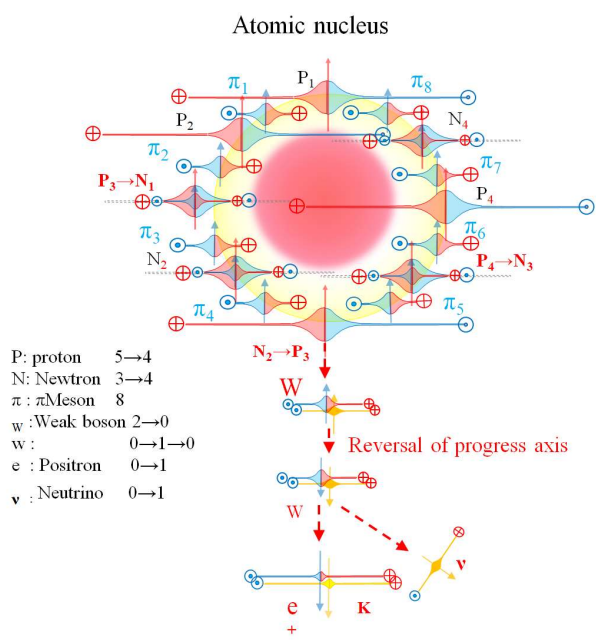
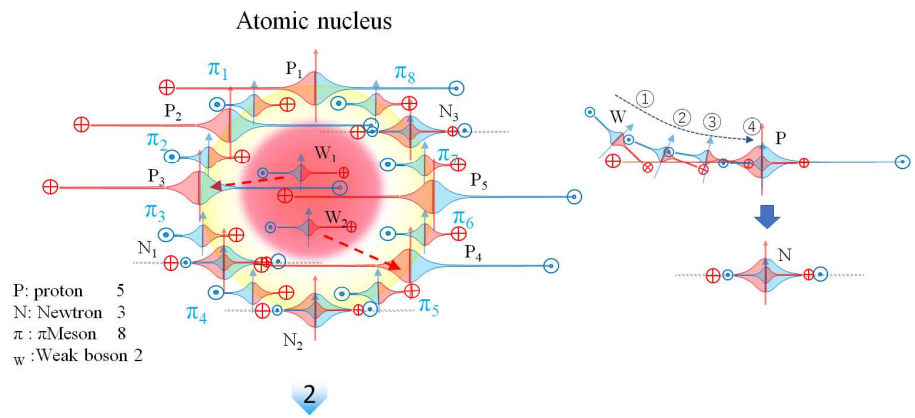
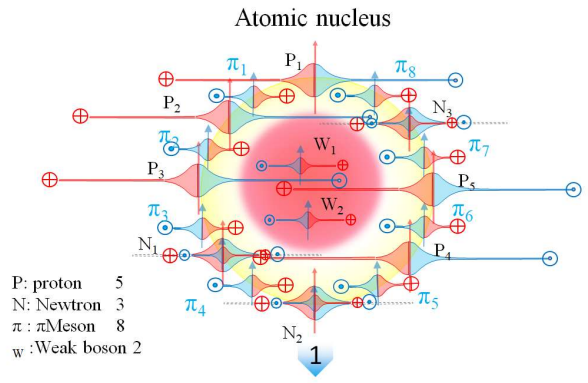
The weak boson leaves the nucleus and turns into an electron.

Since it is pushed backwards, its axis of movement is reversed, and it becomes a positron.

Extrusion pressure is applied to the weak boson (deformed electron) in the nucleus, which pushes it into the proton and becomes a neutron.

Since electrons outside the nucleus move to outer orbits when excited, it is the electrons inside the nucleus that produce neutrons.

# $\beta$ plus decay



## **X66.6 Determination of $\beta$ decay**

Whether beta decay is positive or negative can be determined from energy conservation.

However, generally

- The decay of a nucleus with too many neutrons is beta-minus decay.
- Decay beta plus decay of a nucleus with too many protons

I can say that.

That's because protons' rotating foot push up the energy in the nucleus, whereas neutrons don't.

## **X67. Waves generated within the atomic nucleus.**

Electrons interact electromagnetically because of their rotating wave foots.

A photon was originally a kinetic energy which reflects an electron's shape and has separated from the electron.

Therefore, a photon's shape spreads out thinly and interacts with matter.

A weak boson is an electron that has been deformed by the pressure within the atomic nucleus, so its rotating wave while spreading foot is narrow and it is difficult for it to interact electromagnetically.

A neutrino was originally a kinetic energy which reflects a weak boson's appearance and has separated from the weak boson.

A neutrino that is separated from a weak boson by the kinetic energy reflected in a weak boson.

Therefore, the neutrino that reflects the weak boson does not have a widely spreading wave.

This is why neutrinos can pass through matter.

When the weak boson leaves the nucleus, it no longer has the energy to compress it, so it immediately returns to its original state as an electron.

## **X68. Strong force**

### **X68.1. Type of strong force**

There are two types of strong force.

**Strong force A:** The force that binds quarks together to form nucleons such as protons and neutrons.

**Strong force B:** Force that binds hadrons such as protons and neutrons.

### **X68.2 Strong force A: the force that creates nucleons.**

**Current explanation**

The force that binds quarks together to create nucleons such as protons and neutrons. This force is mediated by gluons.

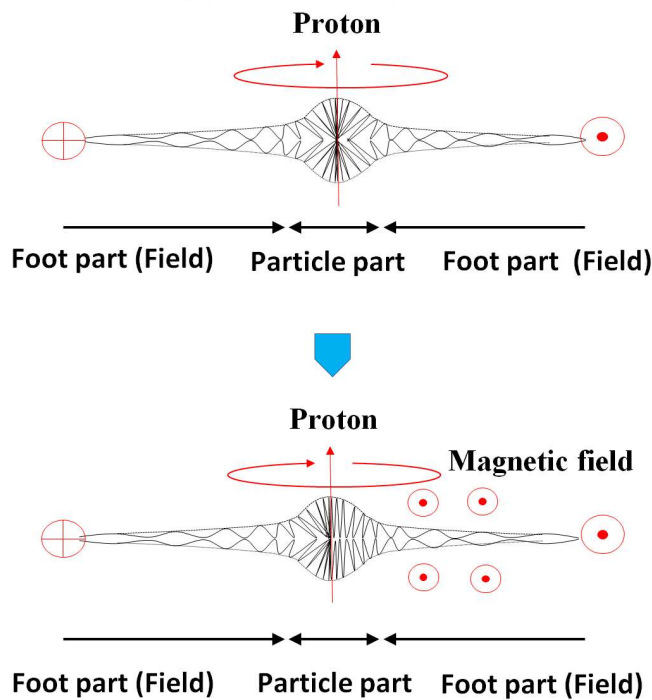
The distance that a gluon's force can reach is approximately the radius of a hadron. And the further away it is, the stronger it becomes. On the other hand, when nucleons get extremely close to each other, a strong repulsive force (repulsive force) acts.

**Energy Body Theory**

Since neither quarks nor gluons are assumed, there is no need for a force that binds quarks together.

However, the spring-like force that acts when trying to break a proton is a force that resists from being stretched the vibration of a local area of space toward a center point. The range that the force extends is approximately the radius of the particle part.

**Appearance of gluons**



The contraction and expansion of the energy body cells that form the particulate parts of elementary particles are directed toward a single point at the center. For this reason, when a magnetic field is applied and the particle part is pulled, the point shifts and the direction of vibration changes, so a force of resistance acts to keep it from changing.

### X68.3. Strong force B: the force binding hadrons together

#### Current explanation

The force that connects hadrons such as protons and neutrons

This force is mediated by pi mesons.

The pi meson proposed by Hideki Yukawa has taken on a different shape with the introduction of quarks.

#### Energy body theory

We believe that the force that connects hadrons is the real pi meson proposed by Hideki Yukawa.

I am estimating that a pi meson is a deformed and excited electron.

A rotating wave of electrons sandwiched between protons or neutrons moves in the same direction as the protons or neutrons, so they exert an attractive force.

Electrons sandwiched between protons or neutrons are squeezed and narrowed at the foot of the rotating wave, and the particle part also becomes large.

Electrons in this state are considered to be  $\pi$  mesons.

Since there is no foot (field), there is no electromagnetic interaction via the field.

Strong force is generated due to direct electromagnetic interaction in the particle part.

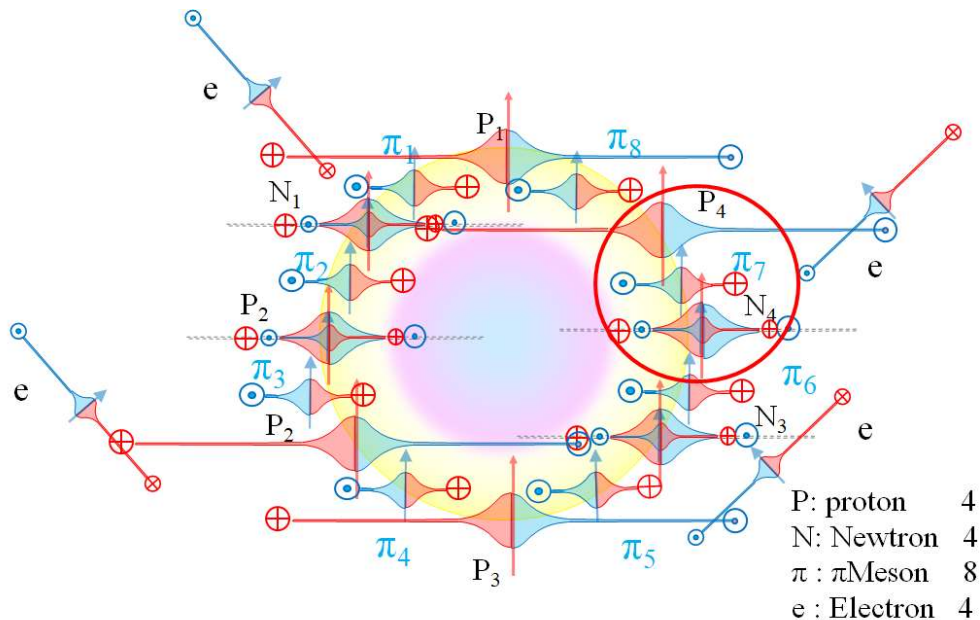


Fig.X68.3

#### **X68.4 Thought experiment.**

A thought experiment (roughly) was carried out on the change in the strong force acting between the protons,  $\pi$  mesons, and neutrons that make up the nucleus, when they approach each other.

I predict that the strong force is proportional to the volume of the overlap.

Overlapping waves of the same color have the same wave direction and act as an attractive force, while overlapping waves of different colors have different wave directions and act as a repulsive force.

The blue and red arrows in the bar graph are the same color overlapping, which means attraction, and the red and blue mixed arrows are different colors, which means repulsion.

The number of arrows represents the strength of the strong force by the size of the color overlap.

The upper part of the bar graph is repulsive force, the lower part is attractive force, and the sum is the line graph.

As the three overlaps, the attraction increases, but as they get closer, the repulsion becomes stronger.

On June 20, 2007, a research group from the University of Tsukuba and the University of Tokyo simulated quantum chromo dynamics (QCD) using a supercomputer to elucidate the origin of the strong force inside the atomic nucleus. Same result.

It is strange that the result is almost the same as the elementary particle model of energy body theory that does not assume quarks.



Fractuation of Attraction Force between Proton and Neutron

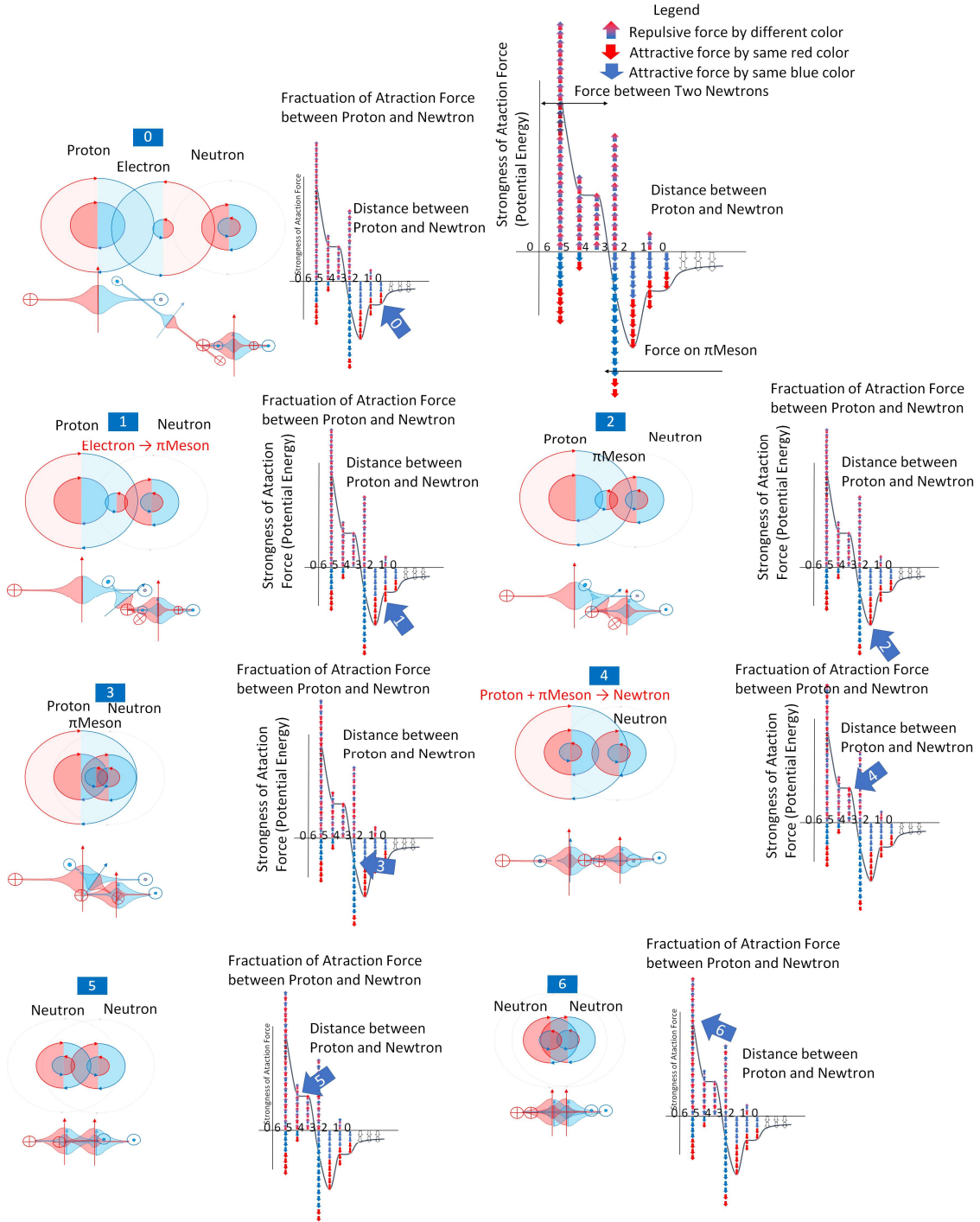


Fig.X68.4

X69. "Pair annihilation" and "Pair Creation"

X69.1. Current understanding

**"Pair annihilation"**

It is a phenomenon in which pairs of elementary particles and their antiparticles coalesce and annihilate, converting into other elementary particles and energy.

The electron-positron pair annihilates into a photon.

The pair of protons and antiprotons annihilates, and many mesons are generated.

**"Pair Creation"**

This is a phenomenon in which light simultaneously transforms into pairs of electrons and positrons or protons and antiprotons.

In other words, matter (particles and antiparticles) is generated from energy.

However, no direct experiment has yet been conducted to convert light into protons or antiprotons.

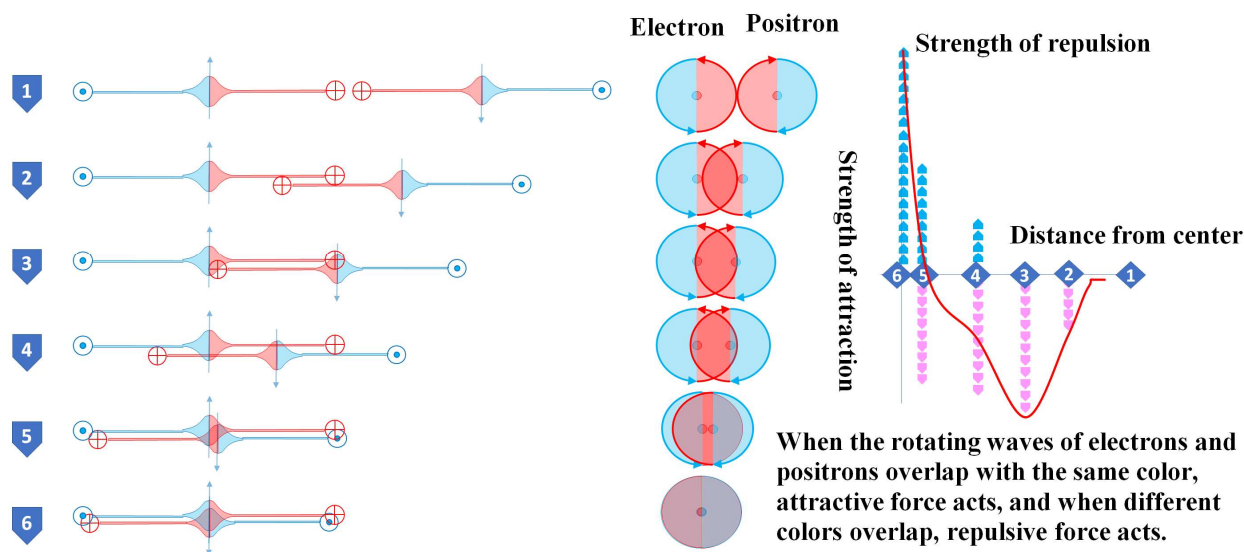
**X69.2. "Pair annihilation"**

"Annihilation": Energy body theory (explanation limited to electrons)

When a pair of an electron and a positron (electrons with opposite propagation axes) combine, they annihilate into a photon.

Unlike the electron-proton bond, the electron-positron bond has both the same mass, so the attractive force is stronger until just before they completely overlap, and the repulsive force works explosively at the final moment.

**Overlapping rotating waves of electrons and positrons and changes in the strength of attraction and repulsion**



When the repulsive force acts explosively, electrons and protons become photons and fly away.

The reason that the material particles as electrons and protons become photons is that they move laterally.

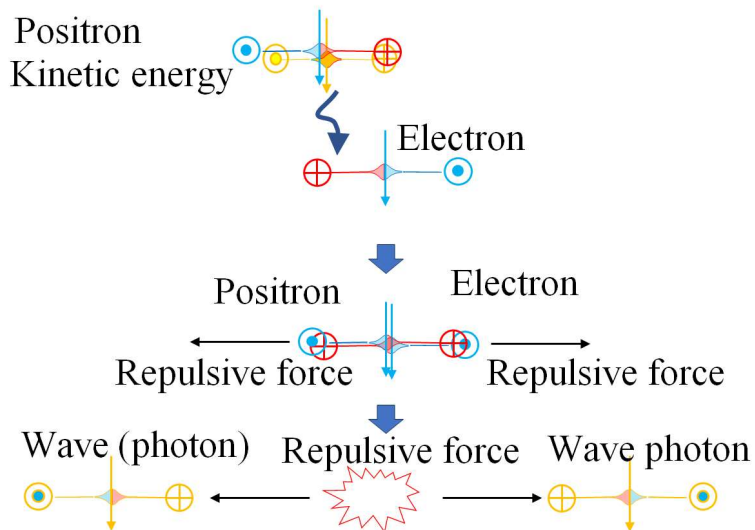
Since it moves laterally, no kinetic energy is generated.

That is, photons.

Matter particles generate kinetic energy and are dragged by the kinetic energy to move.

A photon is itself kinetic energy.

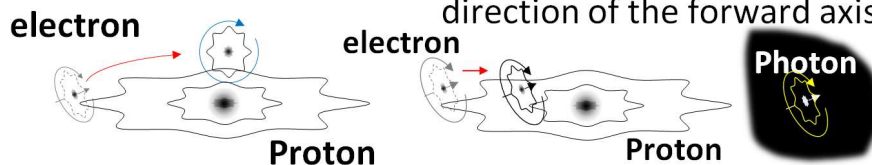
### Pair annihilation of electron and positron



When electrons move laterally (perpendicular to the axis of travel), they do not generate kinetic energy. The self becomes kinetic energy (photon). This is because the sides are attenuated and integrated with the space.

(Note: Consistency with experiment unconfirmed)

**When not emitting photons** Rotate in orbit (move laterally)  
**When emitting photons** Transition (movement in the direction of the forward axis)



### **X69.3. "Pair Creation"**

"Pair production" is not the reverse process of "pair annihilation" but is a separate phenomenon. An antiparticle is a particle that moves in the opposite direction of the particle. When a photon (kinetic energy) hits a particle from the front (in the direction of its Progress axis), the particle will move in the opposite direction to its Progress axis. Since the particles move in the opposite direction to the Progress axis, the waves rotating around their own axis will rotate in the opposite direction. Since the electric charge is determined by whether the particle is rotating in the left or in the right with respect to the Progress axis, particles are created which mass remains the same but only the electric charge is reversed. This is the generation of antiparticles.

### **X69.4. Pair creation and annihilation with no inverse process**

#### **Current understanding**

Electrons and positrons are generated when a substance is irradiated with  $\gamma$  (gamma) rays. However, "a pair production" is not the reverse process of "a pair annihilation".

This is because the positron emitted from the nucleus in beta-plus decay is not emitted in pairs with electrons.

When an accelerator fires an electron beam into a target such as a heavy metal, gamma rays are generated.

These gamma rays generate electrons and positrons within the metal.

#### **Energy body theory**

In energy body theory, a positron is an electron that moves in the opposite direction to the electron's axis of travel.

When a gamma ray strikes the front side of an electron toward its Progress axis, causing the electron to move in the opposite direction.

Since the electron starts to move in the opposite direction to the axis of travel, so swaps the Progress axis. This is the generation of positrons.

### **X70. Pair creation and pair annihilation simulation**

Based on experiments at KEK, the process from the creation to the annihilation of positrons is simulated using a particle model based on energy body theory.

#### **X70.1. Generation of gamma rays**

When highly accelerated electrons hit a substance such as a heavy metal, the electrons that

pass by the atomic nucleus collide with the atomic nucleus's strong magnetic field and are deflected.

When the electron's path is bent, the kinetic energy (waves) that was dragging the electron leaves the electron.

This is the photon.

Photons, which are the kinetic energy of electrons accelerated to high speed, are gamma rays.

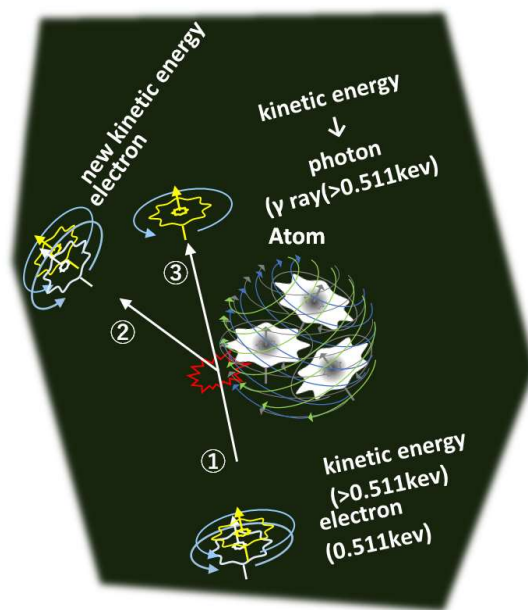


Fig.X70.1

### X70.2. Collision of $\gamma$ -rays to the backside of electrons

Gamma rays generated near the nucleus have a chance of colliding with free electrons in the metal.

If gamma rays collide with electrons to the backside, in opposite direction of progress axis, some of the energy of the gamma rays creates kinetic energy in the front of the electrons.

Electrons are dragged by waves, which are kinetic energy.

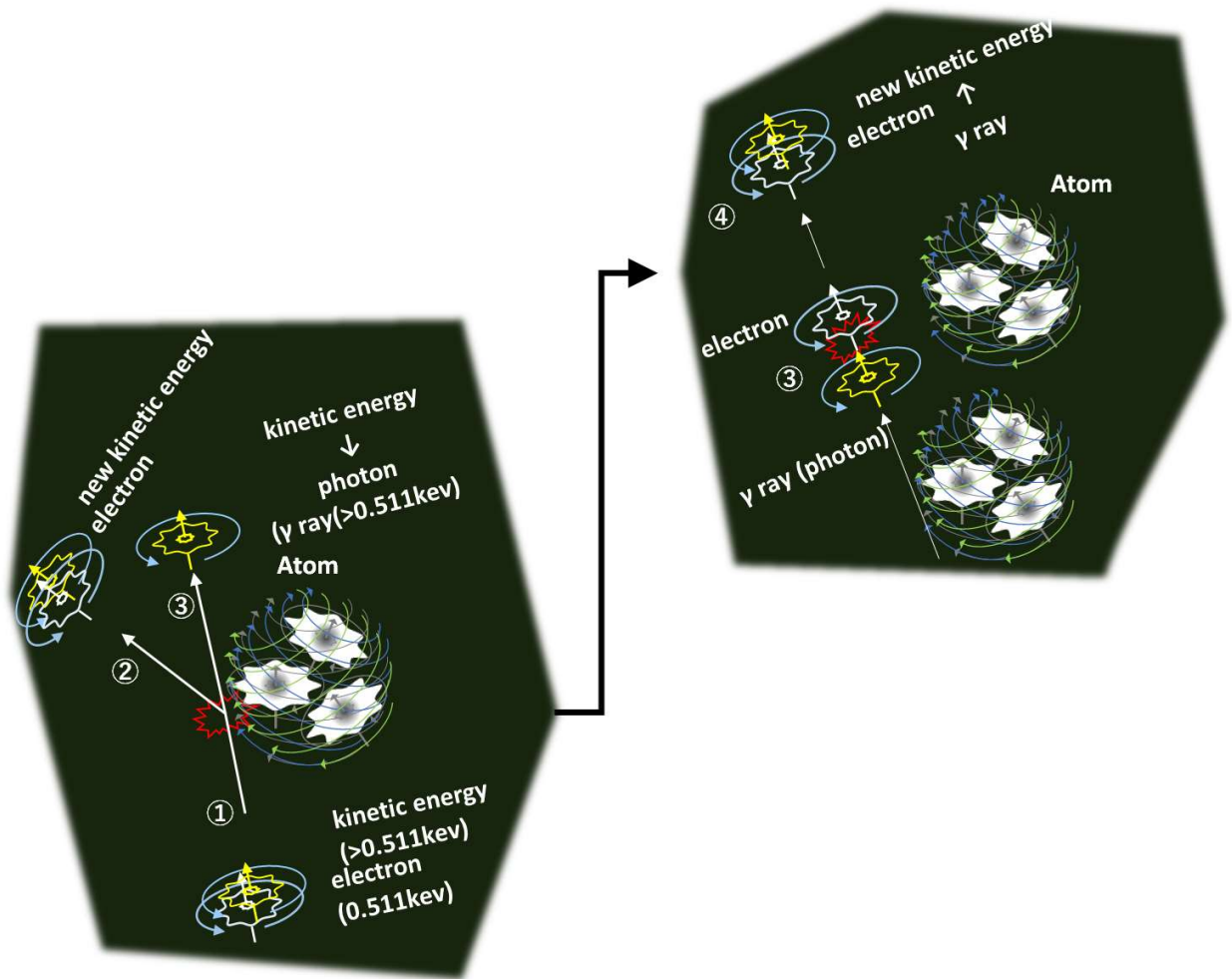


Fig.X70.2

### X70.3. Collision of $\gamma$ -rays to the backside of electrons and generation of positrons

It is also conceivable that the  $\gamma$  -rays collide with the electrons to the frontside, in direction of progress axis.

In that case, the electron will be pushed behind the progress axis.

The direction of the axis is reversed because the  $\gamma$  -ray collision causes the electron to travel in the direction opposite to the direction of the arrow on the progress axis.

Then, the direction of the wave rotating around the electron's own axis is clockwise.

It is the birth of the positron because the counterclockwise rotation is a negative charge, and the clockwise rotation is a positive charge.

The gamma rays that collide with electrons and turn them into positrons transfer to the front of the positron and become kinetic energy. (When gamma rays collide with the front of

the electron, the electron compresses the space behind the electron and generates waves.)

However, when the energy of gamma rays is high, the remaining energy is emitted as photons.

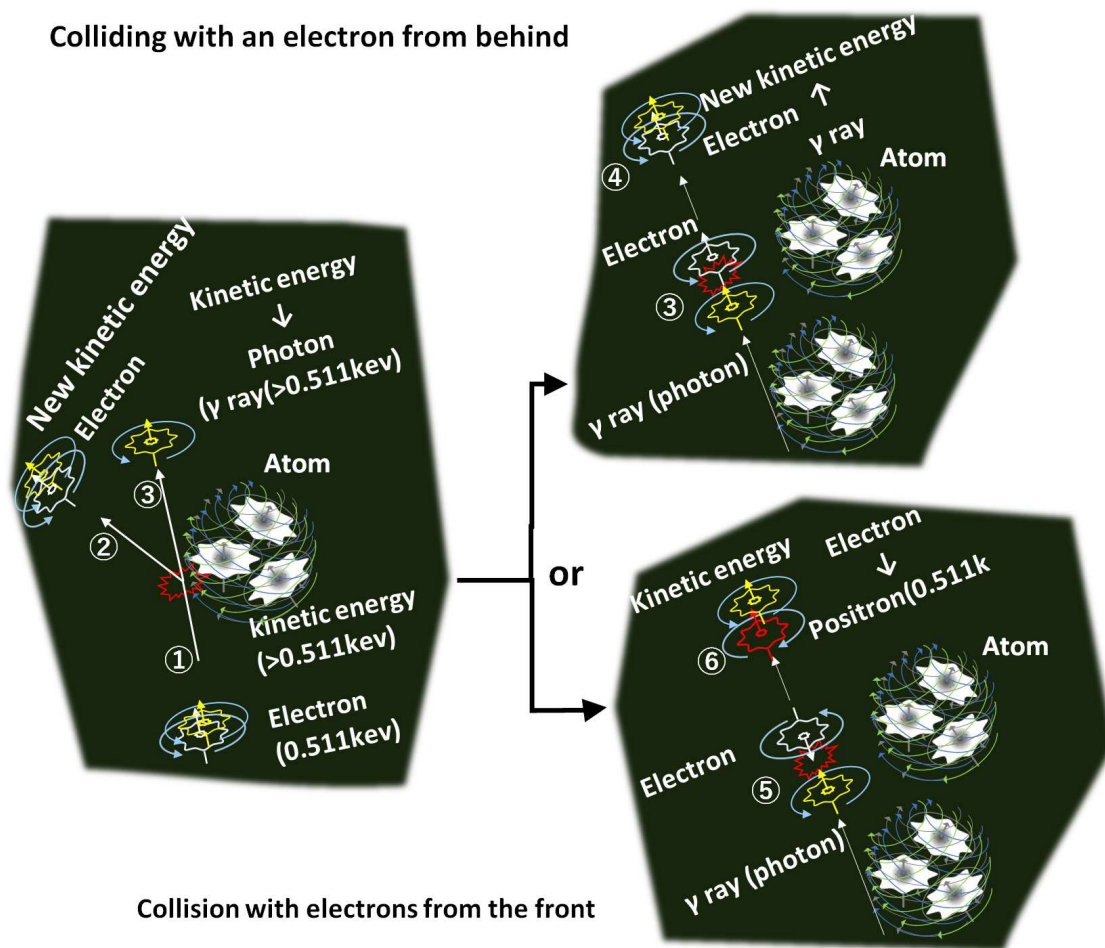


Fig.X70.3

**X70.4. Combination of positron and electron**

Newly generated positrons repeatedly collide with atomic nuclei and electrons, losing their kinetic energy, and become attached to nearby electrons in a low-energy state comparable to thermal energy.



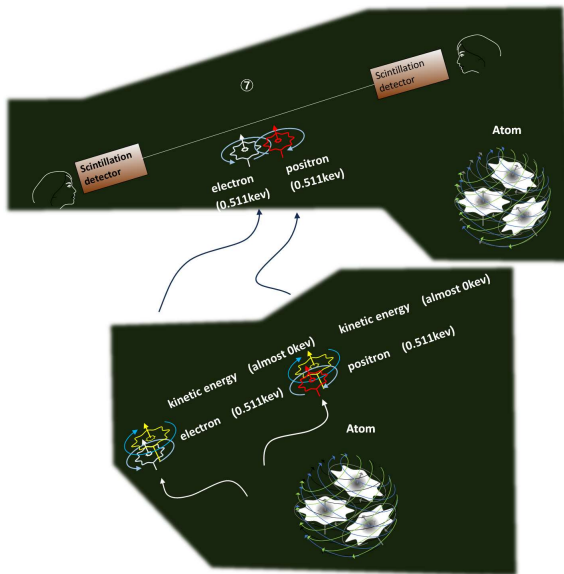


Fig.X70.4

### X70.5. Positron annihilation and photon generation

The rotating waves of electrons and positrons travel in the same direction near the contact point, so they are coupled by an attractive force.

Since electrons and positrons are small and have the same mass, they tend to overlap at once.

However, just before the particle parts completely overlap each other, the repulsion increases explosively.

Therefore, electrons and positrons fly in opposite directions.

At this time, the electrons and positrons move laterally, so they themselves become kinetic energy (waves) and move.

Note that particles that generate kinetic energy and move along with the kinetic energy are called material particles.

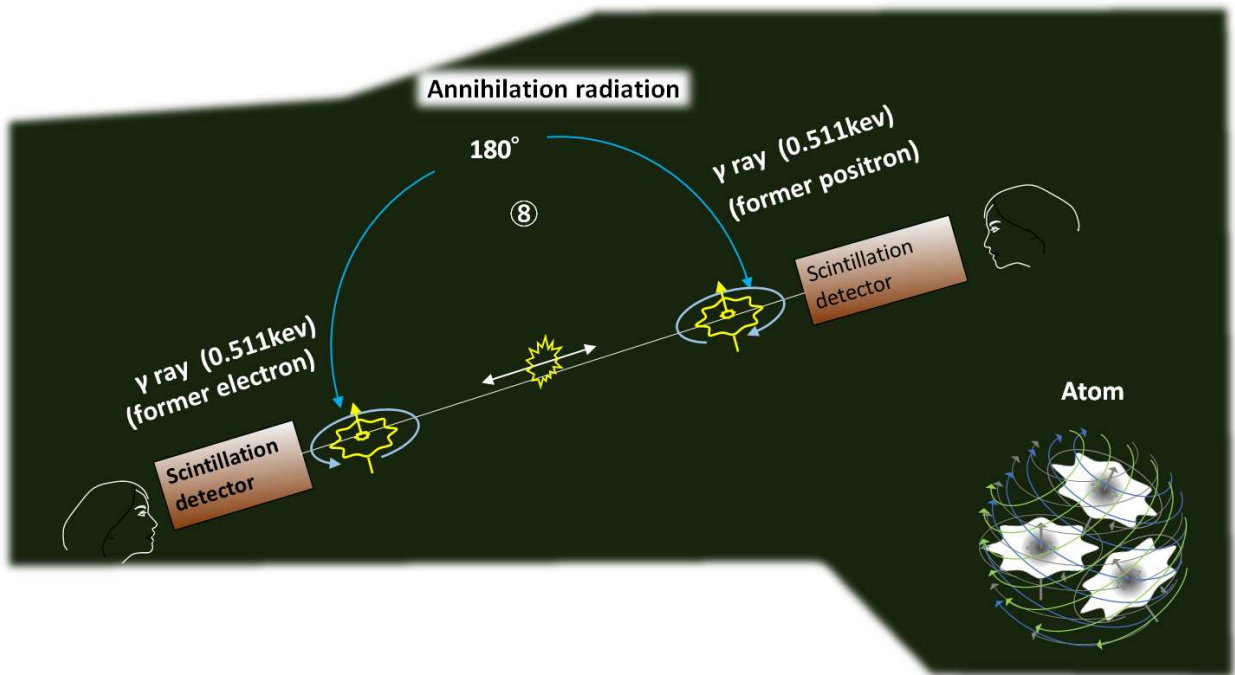


Fig.X70.5

### X70.6. Contrast with Feynman diagram

Pair production and pair annihilation in energy body theory was created following the Feynman diagram.

The Feynman diagram explains that protons change into electrons when they go back in time, but of course this is not the case; positrons are electrons that travel backwards, resulting in spins that rotate in the opposite direction to the progress axis.

# Generation and annihilation of electrons and positrons following the Feynman diagram

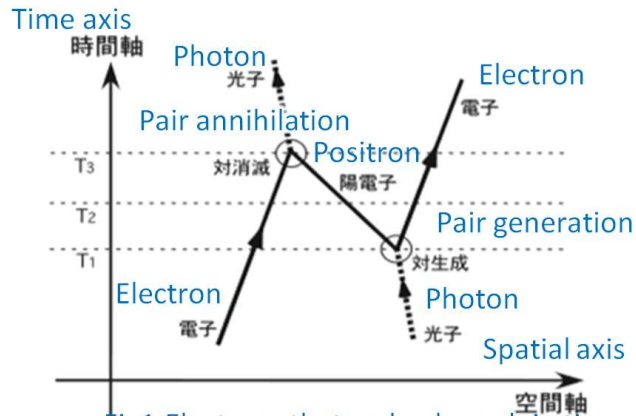
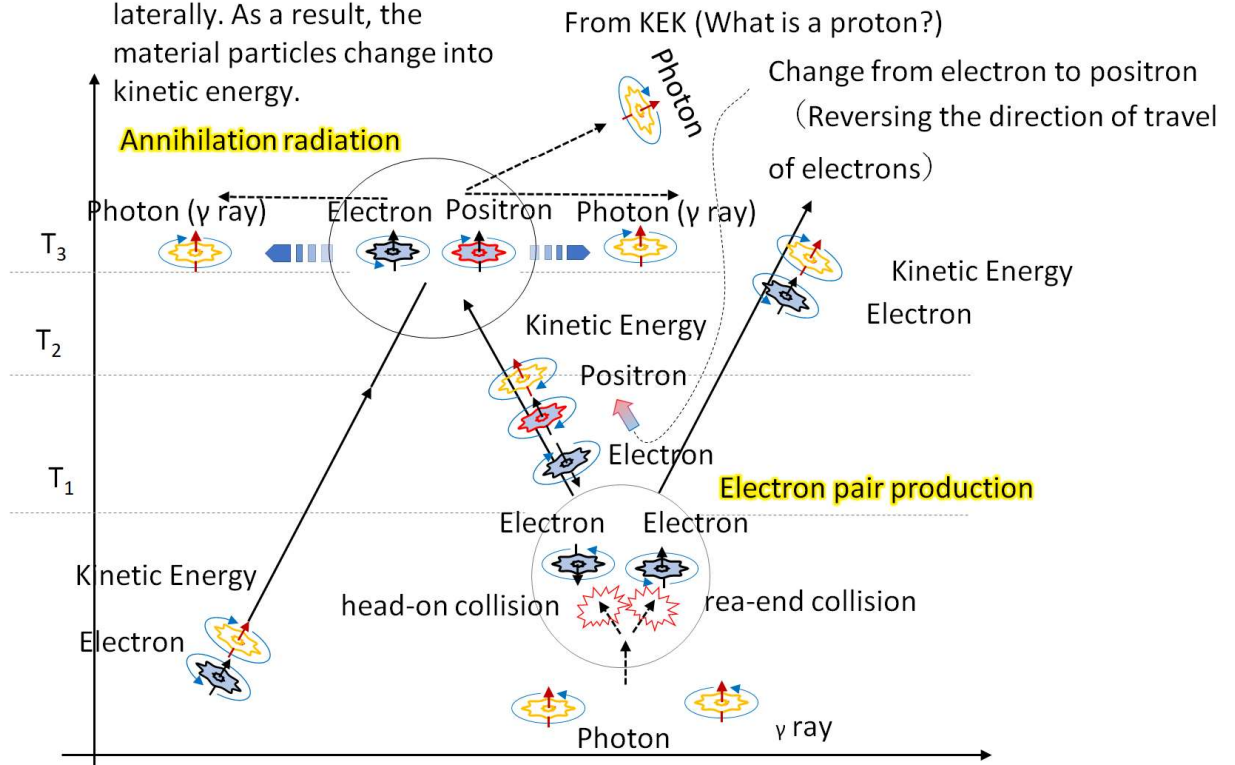


Fig1. Electrons that go backwards in time

図 1: 時間を逆行する電子

Electrons and positrons laterally. As a result, the material particles change into kinetic energy.



Pair formation of an electron and a positron is that an electron moves backward and becomes a positron, and pair annihilation is that the electron itself becomes kinetic energy without kinetic energy.

Fig.X70.6

## X71. Stern-Gerlach experiment

### X71.1. Interpretation of beam vertical separation results

In the Stern-Gerlach experiment, a beam of silver particles passed through an inhomogeneous magnetic field splits vertically.

This shows that the silver particles have magnetic moments.

The magnetic moment that creates these two upward and downward states is spin.

The origin of spin is thought to be that electrons have magnetic dipole properties.

Note that the magnetic moment of silver atoms is derived from the fact that electrons have magnetic moments.

However, if you think about it carefully, there is something strange about it.

The magnetic dipole theory predicts that there will be more separation on the upper side, where the magnetic field is stronger (higher magnetic flux density) than on the lower side. In other words, the upper beam should be stronger.

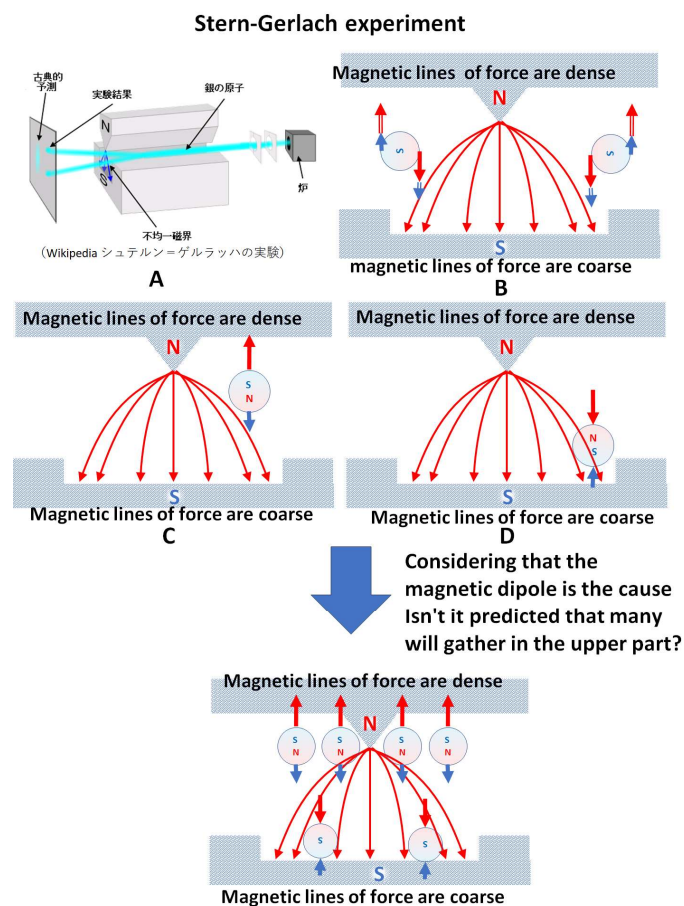


Fig.X71.1

**X71.2. Simulation based on energy body theory.**

About interpretation Stern-Gerlach experiment, I questioned whether the electrons that represent the magnetic moment of silver atoms have the properties of magnetic dipoles.

Replacing this with the electron model of energy body theory, the probability of up and down becomes exactly 1/2, which fits well with the experimental results.

This also shows that the electron model of the energy body theory is correct.

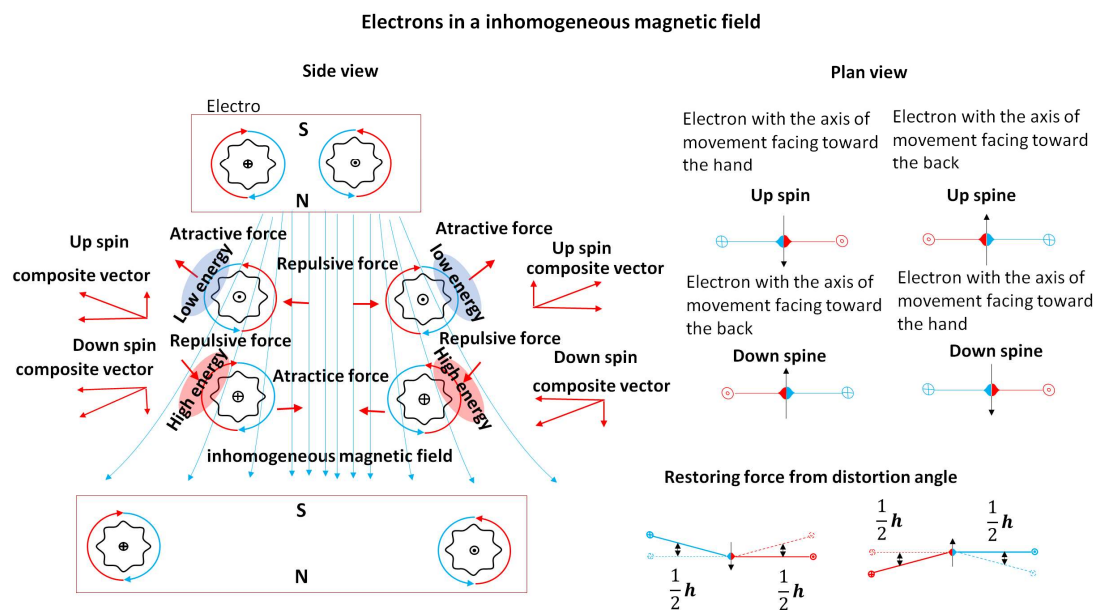


Fig.X71.2

**X71.3. Spin up and down as the relationship between particles and fields.**

Quantum mechanics obscures the magnetic dipole nature of electrons and states that electrons have up-spin and down-spin nature.

But this is also incorrect.

Up spin and down spin are determined by the direction of the electron's rotating wave and the direction of the magnetic field wave (which is also electron's rotating wave).

In an extended version of the Stern-Gerlach experiment conducted by KEK, only the up spin was collected and passed through the experimental apparatus again, which again separated into up spin and down spin.

This shows that up-spin and down-spin are determined by the relationship between

electrons and the magnetic field.

## Extension of the Stern-Gerlach

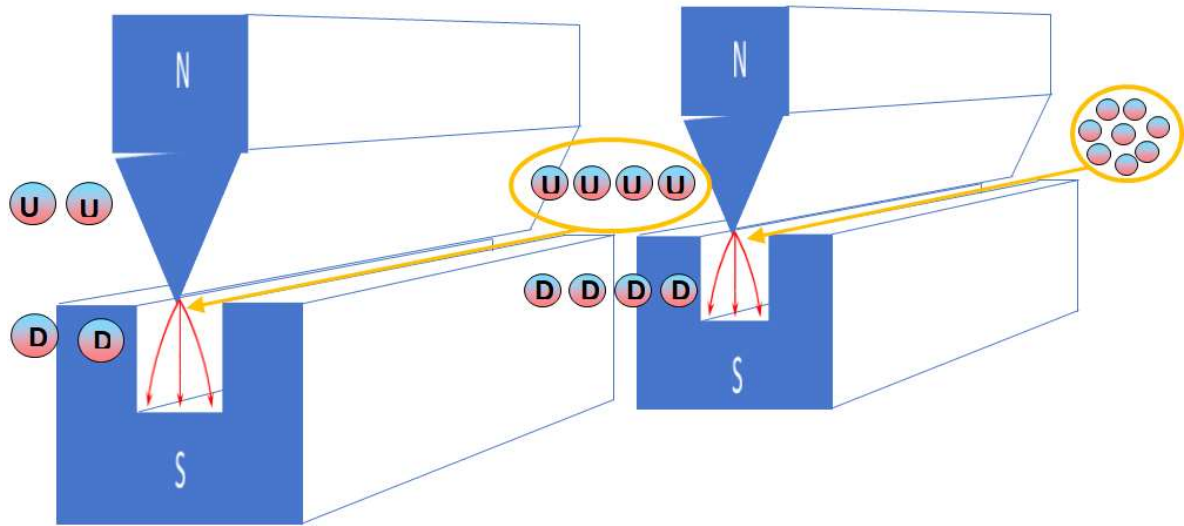


Fig.X71.3

### **X72. $\pi$ mesons, muons are deformations of electrons, neutrinos are kinetic energy**

Since  $\pi$  mesons and muons are deformations of electrons, and neutrinos are kinetic energy (waves generated in space), it is inappropriate to recognize them as separate elementary particles. It should be thought of as a deformed electron.

A  $\pi$  meson is an enlarged electron sandwiched between nucleons.

The spreading foot of the rotating wave gets narrow between the nucleons, making it difficult for electromagnetic interaction to occur.

Pions quickly decay into muons and neutrinos.

The neutrino is the kinetic energy of a pion being released from a nucleon.

A muon is a state immediately after an electron, which has been enlarged by being sandwiched between nucleons, has left the nucleon.

Muons quickly decay into electrons (positrons) and neutrinos.

This neutrino is a wave (kinetic energy) generated in space when the energy of a muon is released all at once and returns to an electron.

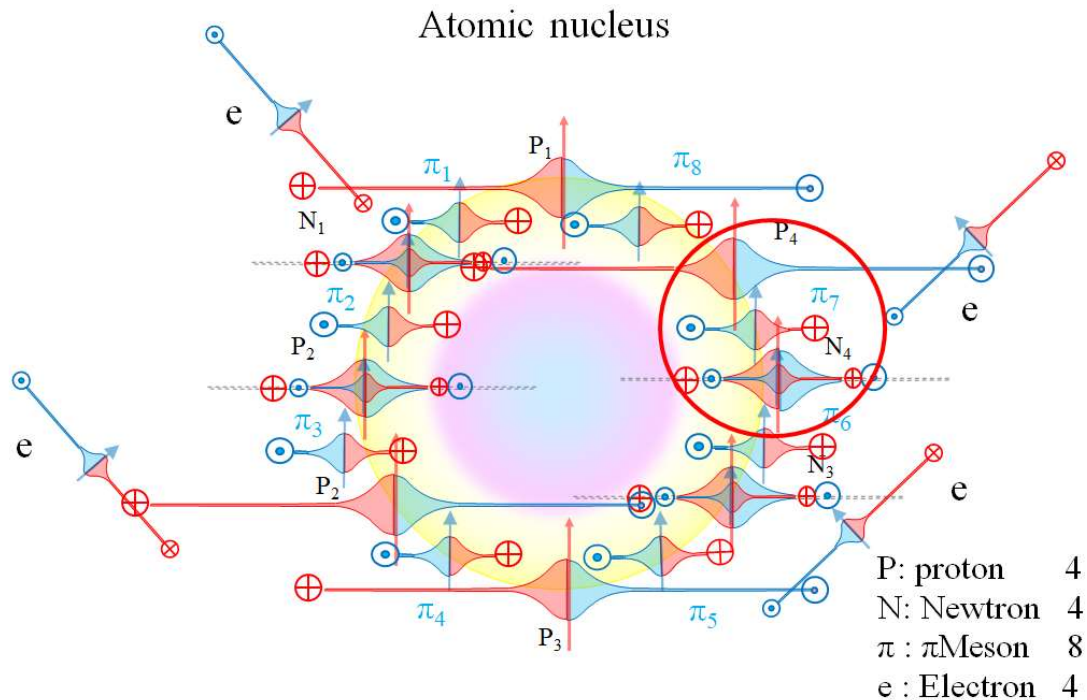


Fig.X72

**X73 Conclusion-**

It turns out that the energy body theory can explain all phenomena without contradiction. It would be difficult to list all the results here, so I will list some of them below. Many fundamental principles and mechanisms that have not been covered in physics have been clarified.

- 1.The reason why stars move away isotropically is not due to the expansion of the universe but to the universe circulation system.
2. Cosmic background radiation is the energy that carries stars to the ends of the universe, causing them to explode and dissolve.
3. Gravitational field is a distortion of space. (also, Dark matter and positive energy)
- 4.Dark energy is a distortion of space. (Negative energy)
- 5.Elementary particles are particles that are excited in local space with spinning by surplus energy when a gravitational field is formed.
6. The sum of all gravitational fields and particle energies is equal to total dark energy.
7. Kinetic energy is a wave generated in the space in front of an elementary particle.
- 8.The kinetic energy that leaves an electron is called a photon. When separated from the



electron, it spreads out into a disk shape (doughnut shape).

9. An electron is a wave where space locally excited while spinning. The center of an electron represents the character of a particle, and the expanding foot of one represents the character of a field. The electromagnetic interaction is either attractive or repulsive depending on the direction of the waves at the contact. It moves perpendicular to the spreading plane. At this time, the spreading surface is distorted by the distortion angle  $\theta$ . The restoring force of this distortion is electromagnetic force. The dielectric constant  $\epsilon$ , the speed of light  $C$ , and Planck's constant  $h$  are this distortion angle.

10. Light is a plane wave in which individual photons travel in parallel.

11. The speed of light is the distortion angle of the spreading plane foot of photons. This is the cause of the principle of the constant speed of light.

12. Observe the side of the photon's foot as light. When a photon leaves an electron, its foot expands outward like a donut.

13. In addition to the speed of light, there is also the speed of photons.

14. Other reasons why elementary particles have charges, why electrons and protons have the same charge, the meaning of the flow of electrical energy, why protons have a repulsive core, why gravitational mass and inertial mass are the same, etc.

## Reference

Web; the free encyclopedia Wikipedia

Web; Kotobanku (in Japanese)

Many others