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Essence of Photons and Dark Matters

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Abstract

What exactly are photons and dark matter? Modern physical theories do not explain them very well. In this paper, by extending the law of electromagnetic oscillation, the space particles and their operation law can also be obtained. The system of space particle theory is formed under the law of physics. The conclusion of the theory of space particles is quite consistent with many physical phenomena. There are no contradictions that can be found. According to the theory of space particles, there is an uneven space at the edge of an object, which has been proved by a series of experimental phenomena. The theory of space particles has revealed the essence of photons and dark matter. It has also revealed the relationship between space, mass, and energy. Space is a physical phenomenon.

Keywords

Electromagnetic Oscillations, Space Particles, Energy Bodies, Photons, Dark Matter, Gravity, Uneven Space

1. Law of Electromagnetic Oscillation

For the LC circuit formed by the capacitor and the self-inductor in series, the capacitor discharges and generates a current, the current generates a magnetic field, and then the magnetic field generates an out-of-phase current to charge the capacitor. The current changes periodically to form an electromagnetic oscillation. The oscillation period depends on the value of LC in the oscillating circuit, namely, the period is $T = 2\pi\sqrt{LC}$ [1].

As shown in **Figure 1**, the distance between the two plates of the capacitor is gradually increased, the self-inductor is gradually pulled apart and finally it becomes a linear conductor. Both ends of the conductor are capacitor electrodes, and the self-inductor is the conductor. The linear conductor is equivalent to an oscillating circuit [1]. From **Figure 1**, it can be known that the value of LC in the circuit decreases from left to right, so the natural frequency of the circuit increases

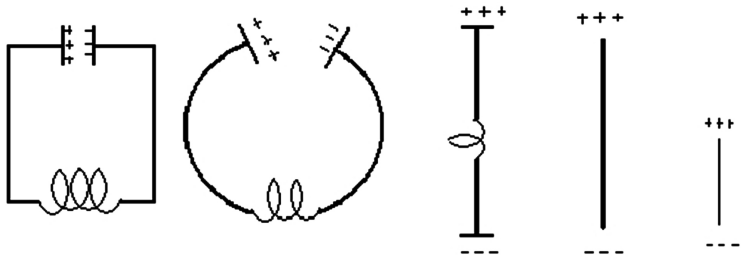


Figure 1. Method of increasing the oscillation frequency.

from left to right. When the external frequency is equal to the natural frequency, the amplitude reaches the maximum value, that is, electromagnetic resonance occurs [1]. The natural frequency of the linear conductor does exist.

The shorter the linear conductor, the smaller the value of L, the thinner the linear conductor, the smaller the value of C. According to the LC oscillation formula, if the length and the cross-section of the linear conductor are continuously reduced, the natural frequency of the conductor will continuously increase until there is no smaller conductor. But there is a smaller space, which can be considered as a conductor. According to Maxwell's electromagnetic theory, the spatial displacement current and the conduction current are equivalent in the generation of magnetic fields [2]. If Maxwell's electromagnetic theory is correct, spatial electromagnetic oscillations will definitely occur, which must follow the law of LC electromagnetic oscillations.

As shown in Figure 2, red indicates energy release, blue indicates energy absorption. There are positive and negative electric fields in the space. The positive and negative electric fields will attract and neutralize each other, forming a displacement current and generating a vortex magnetic field. At this moment, the electric field releases energy and the magnetic field absorbs energy. When the energy of the electric field is depleted, the magnetic field releases energy to form a vortex circuit, which will force the electric field to repel each other and separate the positive and the negative. The electric field absorbs energy. In this case, the electric field and the magnetic field will alternately change with the oscillation as the center to form a spatial electromagnetic oscillation. When the magnetic field releases energy, it is like charging a capacitor. When the electric field releases energy, it is like generating a magnetic field by a coil.

The maximum length of the space occupied by the positive and negative electric fields (*i.e.* the length of the displacement current) can be considered as the length of the conductor, and the area of the largest circle of the vortex magnetic field can be considered as the cross section of the conductor. According to the LC oscillating circuit formula of the conductor, the shorter the length of the spatial displacement current, the smaller the cross-section, and the higher the natural oscillation frequency. The length and the cross-section of the displacement current constitute the volume of the space occupied by the electromagnetic oscillation (*i.e.*, oscillation volume). In other words, the smaller the oscillation volume of the space, the higher the natural frequency.

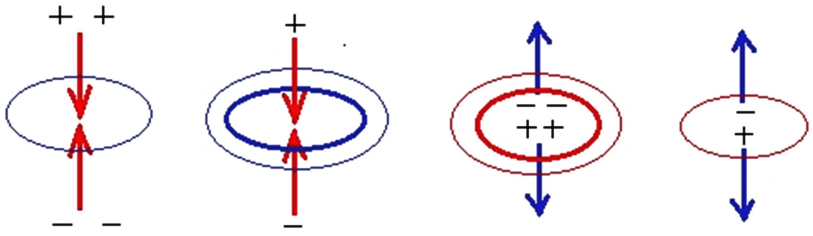


Figure 2. Spatial electromagnetic oscillation.

On the other hand, it can also explain the relationship between the oscillation volume and the frequency. As shown in Figure 2, when the electric field or the magnetic field releases energy, the energy is always concentrated towards the center of the oscillation. When the electric field or the magnetic field is generated, the energy always spreads outward from the center of the oscillation. In other words, the higher the oscillation frequency, the shorter the duration of outward diffusion, and the smaller the oscillation volume.

Due to the particularity of spatial electromagnetic oscillations, the oscillation frequency is also related to the amplitude. When the oscillation frequency is constant, the oscillation volume is also constant. Under the same channel conditions, the rate of change of electric flux and magnetic flux will not change. Therefore, the peak values of the electric field and the magnetic field are constant. When the oscillation frequency increases, the peak values of the electric field and the magnetic field must increase because the space channel conditions are the same. The frequency will not increase only by increasing the potential difference, improving the rate of change of electric flux and magnetic flux, and shortening the change time corresponding to the oscillation period. In other words, the oscillation frequency is proportional to the rate of change, and the rate of change is proportional to the amplitude [2]. Hence, in the case of the wave source being fully resonant with the space, the frequency of spatial electromagnetic oscillations is proportional to the amplitude.

When the magnetic field releases energy in the spatial electromagnetic oscillation, the peripheral electric field (with the same direction as the generated electric field) is strengthened. The generated electric field is repelled by the peripheral electric field and cannot diffuse. In this case, the space occupied by the generated electric field will be compressed, making the electric field energy more concentrated, so the peak value of the electric field increases. That is to say, the smaller the oscillation volume, the larger the amplitude. When the peripheral electric field is weakened, the electric field will diffuse outward, making the peak value of the electric field decrease, the oscillation volume expand, the amplitude narrow.

Therefore, in spatial electromagnetic oscillations, oscillation volume, amplitude, and frequency are corresponding relationships. Once one of these three values is determined, the other two values are also determined. The oscillation volume, amplitude, and frequency are the results of the natural matching of electromagnetic oscillations in space.

2. Space Particles

The length is produced in comparison with artificially established standards. If a cubic meter of vacuum can be divided infinitely, then for a small vacuum that is infinitely divided, a cubic meter of vacuum is infinite, so the size of the spatial volume is relative. As mentioned above, the higher the electromagnetic oscillation frequency, the smaller the spatial volume of the oscillation, then the electromagnetic oscillation with the highest frequency in the space can minimize the division of the space. These electromagnetic oscillations with the highest frequency are space particles, In other words, space is made up of space particles.

Since the space particle is an electromagnetic oscillation with the smallest volume when space particles interact, the oscillation direction is prone to deflections, so space particles have a high degree of freedom, and the energy of space particles can be transferred in any direction.

The space particle can be considered a sphere. The center of the sphere is the center of electromagnetic oscillations. Its diameter is the length of the displacement current. This sphere can accommodate at least three electromagnetic oscillations perpendicular to each other. As shown in Figure 3, in the schematic diagram of space particles, red indicates the electric field and blue indicates the magnetic field. Due to the repulsion between the electric fields, the electromagnetic oscillation cannot diffuse, enabling space particles to exist. There must be an interaction force between the space particles. The existence of space particles should focus on the dynamic interaction of electromagnetic oscillations rather than the model.

As mentioned above, in spatial electromagnetic oscillations, positive and negative electric fields attract each other and produce variable electric fields, producing variable magnetic fields. When the variable electric field becomes depleted, the variable magnetic field releases energy, forcing the positive and negative electric fields to repel each other and gradually separate. In brief, electric

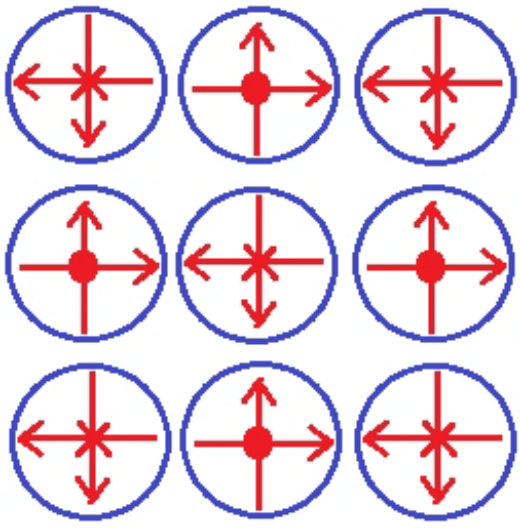


Figure 3. Schematic diagram of the space particles.

fields may attract each other, and the result of gravitation is repulsion. Or electric fields may repel, and the result of repulsion is gravitation. In other words, the result of the gravitation between space particles is repulsion, and the result of repulsion is gravitation, so both gravitation and repulsion exist between space particles.

The above opinions can explain Newton's third law from the microscopic perspective. When an object is pushed by hand, space particles between the hand and the object are under pressure, which is equivalent to an increase in the gravitational force between the space particles. Since the result of gravitation between space particles is repulsion, which increases the repulsion between space particles. The increased repulsion can precisely resist this thrust force. Therefore, there is a reaction force if there is a force, and they are equal in magnitude and opposite in direction. When a non-Newtonian fluid is hit with a hammer, the non-Newtonian fluid presents to be very strong. This is because the molecular volume of the non-Newtonian fluid is relatively large, and the pressure is not easily transmitted in other directions. The greater the pressure between space particles, the greater the repulsion to resist the hammer's hitting force, making the non-Newtonian fluid strong.

As mentioned before, the size of the space is generated by comparison with standard units. Space can only have its size if it is comparable. In other words, the most basic condition for the space to have a scale is that the space is comparable. Space particles just make the space comparable. The internal space of space particles is not comparable. There is no distance within space particles and the space has no size. Only the changing law of electromagnetic fields runs inside space particles.

Since the electromagnetic field always diffuses from the strong to the weak, when the energy of a space particle is high, the space particle will transfer the energy to its neighboring space particles. The field strength of the electromagnetic oscillation of the neighboring space particles will increase, making the interaction force of the space particles increase. In the process of energy transfer, the gravitation between space particles first actively increases, and then the repulsive force increases. It is similar to the gravitation generated between two conductors in series when the current passes through them. In this case, the binding force of the neighboring space particles becomes stronger, and the diffusion of electromagnetic oscillations of space particles is restricted, making the volume of the space particles match the energy. In other words, the energy makes the space particles and the space exist.

Since space particles constitute space, why haven't they been discovered? Because the energy of space particles is quite huge, making the frequency high and the volume small. And space particles are evenly distributed in all directions. Although space particles have a very strong field strength in an instantaneously small range, the field strengths in all directions will cancel each other from a macroscopic perspective. So the macroscopic space is very peaceful, and space particles cannot cause any change in material particles. When many space par-

ticles have the same changes under the action of external forces, they can cause changes in matter particles, such as force, light, and electromagnetic fields.

3. Energy System of Space Particles

As shown in Figure 3, when the energy of the central space particle is maximum, it will release energy to surrounding space particles and generate gravitation. The gravitation will generate pressure. The central space particle must withstand the squeezing force of surrounding space particles. The oscillating electromagnetic field of the center space particle is locked within a smaller range, which will not only increase the electromagnetic field strength of the central space particle but also increase the energy of the central space particle. That is to say, the central space particle will obtain energy when it releases energy.

In a wide range, when a certain space particle has the strongest energy, it becomes the central space particle. It releases energy to obtain energy, and then releases the energy after obtaining it, thus attracting space particles farther away. In this way, the central space particle can obtain greater energy. The energy continues to increase during the cycle, making the energy of the central space particle far exceed the original energy, until the energy is weakened during the transmission and can no longer attract more space particles, and the energy stops increasing. At this moment, the central space particle attracts space particles within a large range. The attracted space particles generate pressure on the central space particle from far to near, making the energy of the central space particle always the strongest, and the energy of the central space particle forms a stable dynamic cycle. So once the central space particle obtains energy, this energy will be difficult to disappear.

Since space particles have a high degree of freedom, there are gravitation and repulsion at any angle between space particles. Under the action of gravitation and repulsion, a stable whole is formed with the central space particle as the center, namely, an energy body. The key to the formation of an energy body is that the energy of the central space particle is always the strongest. In addition, there is a large energy difference between the central space particle and the outermost space particle. The larger the energy difference, the more stable the energy body. The central space particle is not just a space particle, but a central high-energy region.

In an energy body, since the energy fills the space particles, the energy gradually weakens as it moves away from the central region. Therefore, the gravitation and repulsion between the space particles in the inner layer of the energy body are large, and the gravitation and repulsion between the space particles in the outer layer are small. Two adjacent energy bodies will compete for the outermost space particles, which will bind the energy bodies from each other and stop the outward expansion of the energy bodies.

The energy of the outermost space particles of the energy body is ultimately equal to the energy of the space particles in the environmental space. For the environmental space, these energy bodies are deep holes in the space. This is be-

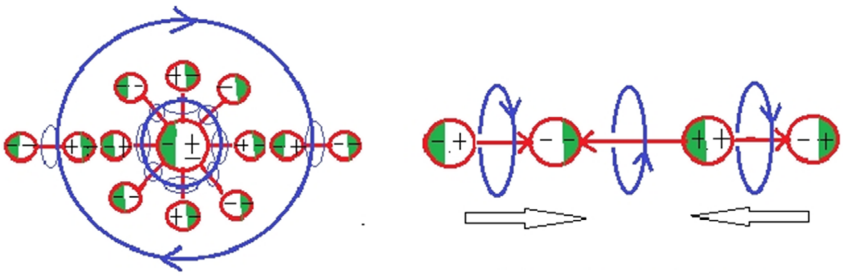
cause the energy of space particles gradually increases while the volume gradually decreases. The space extends to be small, and the internal space of energy bodies is curved.

Since the strength of the electromagnetic field always diffuses to the weak place, which means that the energy is diffused in the electromagnetic field, and this process is irreversible under normal circumstances. It is precisely because the energy is always transferred from the strong to the weak, making the strong-energy space particles generate gravitation on the weak-energy space particles. The gravitation generates pressure, so that the strong-energy space particles are surrounded by pressure to obtain energy. In other words, the energy is concentrated by force. These two methods constitute the dynamic cycle of energy in the universe.

4. Elementary Particles

Elementary particles are energy bodies. The mass of elementary particles refers to the number of space particles bound by energy bodies.

So how are energy bodies charged? As the positive and negative electricity generated by electromagnetic oscillations are equal, their potential is zero after neutralization. In some special environments, the potential is not zero, indicating that there is an excess positive electric field or a negative electric field. The excess electric field is dynamic, which is constantly being neutralized and generated. Because of the magnetic field and rotation of the celestial body, a positive electric field region is formed in the center of the celestial body, and a negative electric field region is formed in the inner layer of the celestial body. The interior of the celestial body is in constant motion. The space particles in the negative electric field region move to the surface of the celestial body, forming negatively charged energy bodies. There is a strong negative electric field in the center of the negatively charged energy body, which will inevitably diffuse outwards. This diffusion depends on electromagnetic oscillation. The diffusion direction of the negative electric field is uniform outwards, thus forming an excess magnetic field. As shown in Figure 4(a), red indicates the electromagnetic oscillation, green indicates the excess electric field, and blue indicates the excess magnetic field. Since the gravitation between space particles results in repulsion, the excess magnetic field will resist the diffusion of the negative electric field. When the



(a) (b)

Figure 4. (a) Electronic composition; (b) Positive and reverse electron meet.

two forms a dynamic balance, the negative electric field will no longer diffuse outwards and it will form stable negatively charged energy bodies, that is, electrons. The positive electric field in the center of the celestial body will form positively charged energy bodies, namely, protons. The central energy of the protons is far greater than the central energy of the electrons.

In short, celestial bodies can form magnetic poles, so celestial bodies can also form electrodes. The existence of electrodes can form charged energy bodies. In the universe, the probability of generating positive matter is the same as that of antimatter. When the positive matter is dominant, antimatter is often strangled in the cradle, preventing antimatter from forming. This is a negative cycle. The more positive matter, the less antimatter.

When an electron and a reverse electron meet, There is a case for the spatial particles on both sides, as shown in **Figure 4(b)**, the peripheral space particles of the electron and the reverse electron meet. Under the action of the electric field, they get close to each other (as shown by arrows). The direction of the vortex magnetic field generated by the electric field and the direction of the vortex magnetic field generated by the space particles on both sides are just the opposite. In the process of approaching, the vortex magnetic field cancels each other out, making the repulsion between space particles cannot generated. There is only gravitation without repulsion between the space particles to accelerate their approach. The vortex magnetic field accelerates the cancellation, just like a chain reaction. The energy bodies of electrons and reverse electrons get quickly disintegrated, the mass disappears. The positive and negative electrons present an annihilation phenomenon.

Due to the annihilation of positive and negative electrons, a spatial disturbance is formed, resulting in several high-energy photons. When protons and electrons meet, as the number of protons bound by space particles is large, while the number of electrons bound by space particles is small, their electric field densities are different. The repulsion between space particles always exists, so it will not be annihilated.

5. Atoms

When protons and neutrons meet, in the absence of external force, they will not intersect deeply, nor will they form an atomic nucleus. However, the energy of space particles is different in different environments. For example, the energy of the space particles in the earth's core is much larger than that of the space particles on the ground. When protons and neutrons meet in the earth's core, the energy in the earth's core will destroy the small-energy space particles in the middle of them and promote their interaction. Once this kind of intersection reaches the ground, it will form a deep intersection, which will be difficult to separate, thus forming a stable atomic nucleus.

Protons and protons will also form a deep intersection based on the same principle. The force between the space particles deeply intersected is very large, which is far greater than the charge repulsion between protons. Obviously, the

strong effect of an atomic nucleus is the electromagnetic force, but its space is reduced by hundreds of millions of times. The space will shrink while the force will increase.

With the increasing number of protons and neutrons, the atomic nucleus will become larger and the depth of the energy bodies of atoms will become shallower. As the depth of energy bodies gets deeper, the force between space particles becomes greater, while the depth of energy bodies gets shallower, and the force between space particles becomes smaller, so large-mass atoms are unstable.

The high-mass atomic nucleus cannot tightly bind protons and neutrons. Some protons and neutrons at the edge of the atomic nucleus can release energy to attract space particles other than the atom. The gravitation is mutual, resulting in cracks between the atomic nucleus and these particles. In other words, the space particles between them are expanding, and the expansion of space particles is accelerated. Finally, the atomic nucleus flies out from these particles at a high speed, resulting in the radioactive decay of the atoms. These unstable atoms seem to cut the energy bodies of atoms under the impact of neutrons, making the energy bodies of atoms rapidly decompose and produce nuclear fission. Once the atomic nucleus has nuclear fission, the large-energy space particles inside will be exposed and release huge energy.

The mass of particles is the number of space particles bound by energy bodies. The energy body of a single proton and a single neutron is a sphere. The neutron and the proton intersect deeply to form an atomic nucleus. The excess space particles in their intersecting area are squeezed away, resulting in mass loss.

When an electron meets an atomic nucleus, its charge gravitation forces the electron to enter the energy body of the atom. The more inward the electron, the greater the repulsion between the space particles. The electron must overcome the repulsion between the space particles to penetrate the atom. When the charge gravitation is equal to the repulsion between the space particles, the distance between the atomic nucleus and the electron will remain unchanged. The electron can only move on a spherical surface with this distance as the radius, so the electron will not fall to the atomic nucleus.

The electron is in a state of balance between gravitation and repulsion. When the electron is disturbed by space and makes the electron vibrate, that is, the electron absorbs electromagnetic waves. This electronic oscillation will disturb surrounding space particles. In other words, the electron radiates electromagnetic waves, forcing other electrons to vibrate, and the electronic oscillation cycle never ends.

Because of the repulsion between electrons, there cannot be too many electrons at the same energy level. If more electrons need to be incorporated into atoms, pressure is required to press the electrons into the energy bodies of atoms. The energy of space particles varies in different environments. The energy of space particles in the inner layer of the earth is between the earth's core and the earth's surface. The space particles in the inner layer of the earth push the electrons into the atoms. Due to the repulsion, the electrons are distributed

in the atoms and form an energy layer, which makes the atoms form a shell structure. When the atoms exchange energy with the outside world, the electrons will jump between the energy layers to form an electronic transition.

Electrons can never enter the atomic nucleus. Because the energy of the electronic energy body is small, it has become a space particle before reaching the atomic nucleus.

6. Combustion Reaction and Intermolecular Force

Matter molecules are always in thermal motion at room temperature. When there is motion, there will be collisions. Collisions can make two molecules intersect, but this intersection is unstable. The same collision will make them separate. When the temperature rises, the movement speed of the molecules will increase, collisions will increase the degree of molecular intersection and reach the outermost electron layer, making two energy bodies generate gravitation to the same electron. The additional charge gravitation will promote the two molecules to intersect deeply and generate new stable matter molecules. At the same time, high-energy space particles are squeezed out, the degree of space disturbance increases, making the temperature rise, which is the combustion reaction.

The molecules will also form an intersection. This intersection is very shallow, making the gravitation and the repulsion between space particles small, so the intermolecular force is weak. Under the same weak action, the intersecting area of small molecules is small, and the intermolecular force is small as well. The impact of thermal motion at room temperature is easy to destroy this force, so small molecules are mostly gas. Large molecules (multiple energy bodies) have a large intersecting area and a great intermolecular force. The impact of thermal motion at room temperature is not easy to destroy this force. Therefore, most large molecules are liquid or solid. Please refer to organic chemistry [3].

For various matters, the energy of the space particles inside is also different. When they meet, the gravitation and repulsion between the space particles will interact, resulting in liquid surface tension and capillary phenomenon. When the energy of solid space particles is greater than that of liquid space particles, the liquid can adhere to the solid surface and cause an infiltration phenomenon. When the energy of solid space particles is smaller than that of liquid space particles, the liquid cannot infiltrate the solid.

Since the energy of the space particles in the metal is greater than that of the space particles in the environmental space, the metal's gravitation to electrons is greater than the environmental space's gravitation to electrons, the work function refers to the work done by the electrons to overcome this gravitational difference. Obviously, the greater the energy of the space particles inside the metal, the greater the work function. When two different metals contact each other, the metal electrons with a small work function will use thermal motion to overcome the repulsion of the metal space particles with a large work function to enter the metal with a large work function. In this case, both the repulsion and the gravi-

tation are large. This electron cannot go back, thus forming a contact electromotive force [4]. It is worth mentioning that the direction in which the thermoelectric effect of the metal absorbs the kinetic energy of thermal motion is single, and the direction in which the thermoelectric effect of the semiconductor absorbs the kinetic energy of thermal motion is comprehensive.

7. Photons

The oscillation of matter particles can result in the change of the space electric field. The amplitude of the variable electric field is superimposed on the amplitude of the space particles, making a small part of the amplitude of the space particles change uniformly. It is similar to the coupling of audio and short waves. When the electric field of space particles changes, it will inevitably cause changes in the magnetic field of the space particles. The magnetic fields of multiple space particles will be superimposed to form a vortex magnetic field, enabling the magnetic field to absorb energy. Then, the magnetic field releases energy to generate a variable electric field, forming a spatial electromagnetic oscillation.

According to the law of spatial electromagnetic oscillations, the oscillation of matter particles resonates with the spatial electromagnetic oscillation, the oscillation peak formed in the space matches the oscillation volume and the oscillation frequency. Moreover, the oscillation peak in the oscillation volume couples with the space particles at the speed of light, thus realizing the propagation of light. The oscillation frequency of matter particles increases, the light amplitude increases, and the light oscillation volume decreases, namely, the wavelength decreases, and the vortex magnetic field shrinks. The maximum circumference of the vortex magnetic field is half the wavelength.

It can be found that the light propagates in the direction of the electric field oscillation. The vortex magnetic field divides the electric field into many small cylindrical channels. These cylindrical channels are called photon beams. Each series-connected electromagnetic oscillation is a cylinder with a length of wavelength, which is a photon. Light is both a transverse wave and a longitudinal wave. Its electric field is a longitudinal wave, and its magnetic field is a transverse wave. When light passes through the polarizer, the vortex magnetic field in a certain direction is blocked, and the light is polarized.

The energy of a photon is the energy quantum ε, which refers to the energy of an electromagnetic oscillation in photon beams. The energy of the electromagnetic oscillation is proportional to the amplitude, while the amplitude is proportional to the frequency. Therefore, the energy quantum of light is proportional to the frequency of light. The Planck constant represents the unit conversion relationship.

As light shoots far away, the density of the photon beam decreases, thus reducing the intensity of the light. However, the energy and frequency of the photon beam will not change. When an object radiates a large area of electromag-

netic oscillation with the same phase, the vortex magnetic field divides it into multiple photon beams with the same phase. The longitudinal magnetic fields of these photon beams attract each other, which reduces the diameter of the photon beams and increases the amplitude, making the light energy have good concentration and directivity. This is called the laser.

When the photon beams meet metal electrons, the forward negative electric field peak will repel the electrons from the equilibrium position. When the negative electric field peak exceeds the electrons, the electrons will receive the rebound force and the gravitation of the positive electric field peak. In this case, electrons just get the energy of photons, allowing the electrons to obtain work function and fly away from the metal. The total kinetic energy obtained by the electrons is proportional to the peak value of the electric field, and the peak value of the electric field is proportional to the frequency of light. In other words, the total kinetic energy of the electrons is proportional to the frequency of light.

Mass is energy density. The higher the frequency of light, the greater the energy, the smaller the diameter of photon beams. The roentgen rays have huge energy in a small range, so the mass performance is significant, resulting in the Compton effect. It is worth mentioning that the smallest unit of light is the photon beam. Only by increasing the frequency of light to reduce the diameter of the proton beam can the accuracy of the lithography machine be improved.

Because there is no distance inside the space particles, and only the change law of the electromagnetic field runs inside the space particles, the situation of light coupling with any space particle is the same, so the coupling time is the same, regardless of the volume of the space particles. Since the energy of water space particles is greater than that of air, which means that the space particles volume of water is smaller than that of air. At the same time, the number of space particles passing through them is equal, but the distances are not equal, so the speed of light in the water is slower than the speed in the air. Similarly, when light passes through space with uniform energy of space particles, the light propagates in a straight line, and when light passes through space with uneven energy of space particles, the light will bend.

The energy of water space particles is greater than that of air, so an uneven space will be formed at their junction. When light passes through this uneven space, the light will bend, which is the phenomenon of refraction. Similarly, there is an uneven space at the edge of a solid, and light will also be refracted when it passes through. Please see the experimental description.

When the light shoots from the light-dense medium to a light-sparse medium at a large incidence Angle, the refracted light cannot shoot out the non-uniform space at the junction, producing secondary refraction, forming a full reflection phenomenon.

The birefringence phenomenon refers to the phenomenon in which a light beam entering the crystal is split into two beams and refracted in different directions [5]. The energy of space particles in the crystal comes from the earth's core and the center of elementary particles. Since the molecular arrangement of the

crystal makes the energy of the space particles in the optical axis direction is greater than that of the space particles in other directions, a part of the space particles in the crystal form an oblate ellipsoid. The space particles of the ellipsoid and the normal space particles are continuously fused and produced continuously, forming a dynamic coexistence. Finally, they are fused at the edge of the crystal. From normal space particles to ellipsoid space particles, the light will be refracted. Because space particles are ellipsoid, the light will be refracted to different degrees when passing in different directions, thus forming extraordinary rays.

8. Experiment Description

A laser pointer is used to emit a laser beam. The laser beam passes through the edge of the blade, and shines on the wall, as shown in Figure 5. There is a light on both sides of the blade on the wall, which are perpendicular to the blade, and the maximum deviation angle is 30 degrees.

The energy of space particles in the metal is greater than that of space particles in the air. The energy of space particles at the junction of the metal and the air gradually decreases until it is equal to the energy of space particles in the air, thus forming an uneven space with a thickness of several microns. When light passes through the space, refraction will occur. After the light enters the uneven space, different positions have different refraction angles. The light close to the metal is first refracted, and then reflected by the metal, forming a reflected light in the bright area. The light away from the metal is directly refracted, forming a refractive light in the shadow area. When light is refracted, it is always deflected from the light-sparse material to the light-dense material, so the refracted light and the reflected light are perpendicular to the metal.

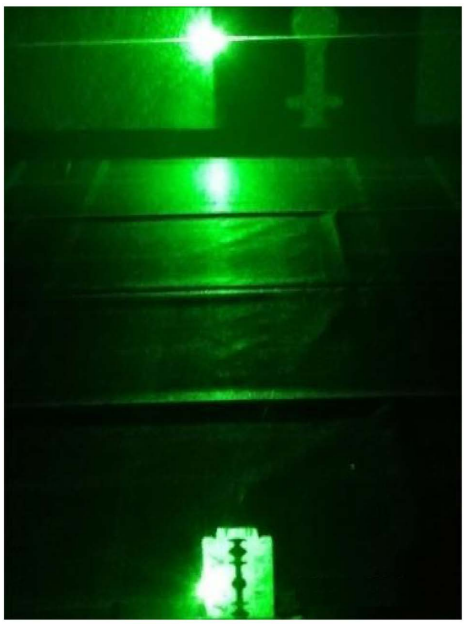


Figure 5. Sharp blade.

Figure 6 shows the image formed by passing the laser beam from the edge of the knife back. Compared with Figure 5, it can be found that the refraction angle and the reflection angle are reduced. This is because the unevenness of the uneven space formed by the sharp object edge will be more prominent, making the light deflection angle large. If it is diffraction, the size of the obstacle is much larger than the wavelength, and the pattern formed is the same. In addition, according to the theory of photon beams, it is impossible to diffract light in this case, so the above phenomenon is light refraction.

As shown in Figure 7, the cutting edges of the two blades are opposed to each other to form a thin slit, allowing the laser beam to pass through to form light and dark fringes on the distant wall. Both left and right knife edges will form refracted light and reflected light. The refracted light on the left interferes with the reflected light on the right, and the refracted light on the right interferes with the reflected light on the left. The interference fringes are quite clear and equidistant. If the width of a single seam is $2a$, and the distance from a single seam to the screen is D, the data conforms to $\Delta x = \frac{D\lambda}{2a}$ [6].

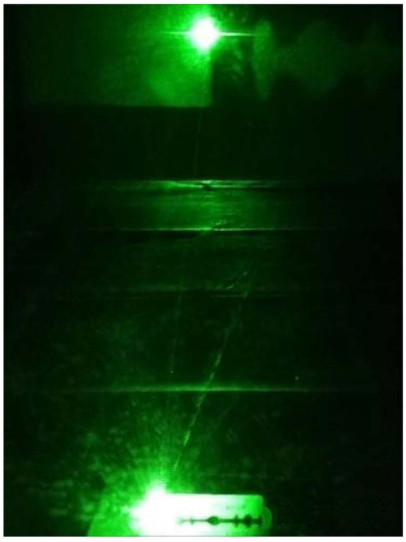


Figure 6. Not sharp blade.

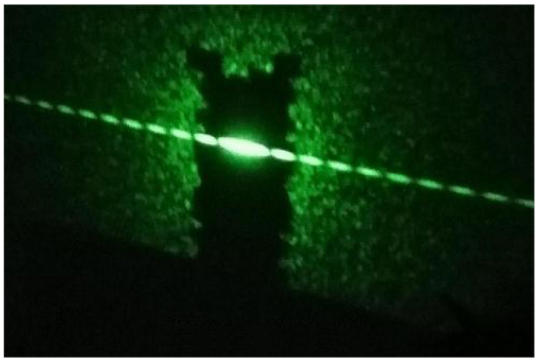


Figure 7. Single seam interference.

As shown in Figure 8, the two blades are placed vertically one after the other to form a thin slit, allowing the laser beam to pass through. From the image formed by the laser beam shining on the wall, it can be observed that there are unequal-spaced fringes on one side and no fringes on the other side. The reflected light of the front blade interferes with the refracted light of the rear blade. Because the phase difference of the light path changes fast with the increasing angle, unequally-spaced fringes are formed, which conforms to the geometric characteristics, so unequally-spaced fringes are not the diffraction of light.

Double-slit interference refers to the superposition of two single-slit interference. The center of the slit is just a uniform space, and light will not be refracted. The interference phenomenon cannot be observed in the center of the slit. It can only be observed at the edge of the slit.

As shown in Figure 9, the blade is tilted. The laser beam horizontally passes through the edge of the knife edge. It can be observed that the refracted light and the reflected light form an arc. When light travels forward, there are two directions of refraction, one toward the metal direction and the other toward the oblique direction. The light is subjected to the superposition of the two refractions to form an arc-shaped light. The diffraction of light cannot explain this arc-shaped light.

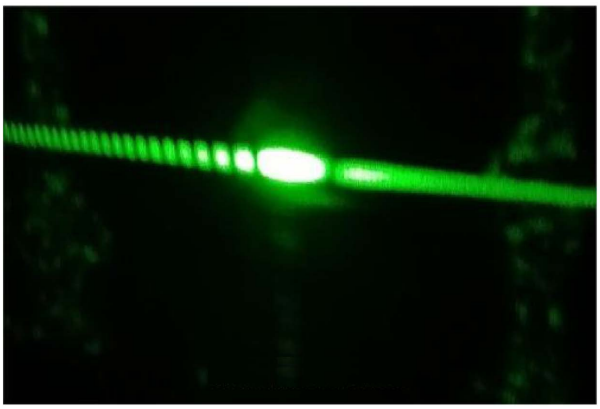


Figure 8. Front and rear blades.

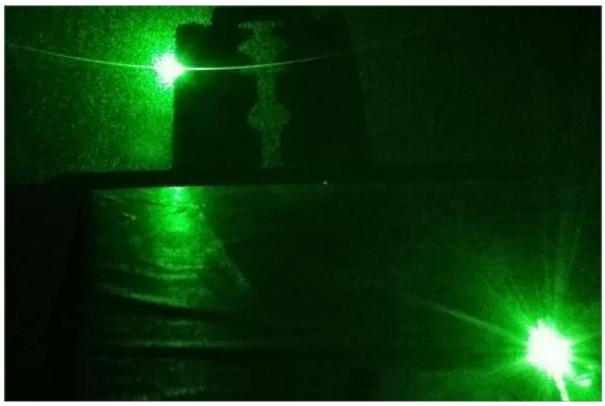


Figure 9. Two directions refraction.

As shown in Figure 10, the condenser lens of the laser pointer is removed; the needle is put into the light and shines on the wall. It can be observed that there are equidistant fringes in the middle and unequally-spaced fringes on both sides. The equidistant fringes are interference fringes formed by the refracted light on both sides of the fine needle. The unequally-spaced fringes on both sides are interference fringes formed by the reflected light by the fine needle and the direct light from the laser pen. Then, the small holes are put in the light and shine on the wall. The small holes can form unequally-spaced circular fringes. The center of the circle can be a bright spot or a dark spot depending on the distance. This is because the light reflected from the edge of the small hole and the laser directly shot by the laser pen form interference. By putting a dime coin into the light vertically and shining on the wall, a very weak Poisson bright spot can be observed. This is because the light perpendicular to the tangent of the circle is refracted. All the refracted light will be superimposed through the center of the circle to form a Poisson bright spot. If the round edge is made into a very sharp knife edge, a brighter Poisson spot will be observed.

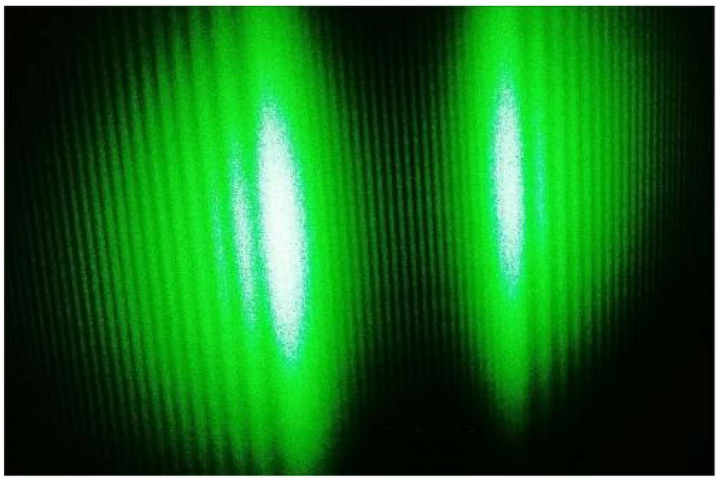


Figure 10. Needle.

The above phenomena show that there is an uneven space at the edge of the object, and the light is refracted when passing through the uneven space, rather than diffraction. These phenomena strongly prove the correctness of the theory of space particles.

9. Temperature

The thermal motion of matter particles acts on the space particles between the particles. Since the gravitation between the space particles results in repulsion, and repulsion results in gravitation, the space particles are in a completely elastic state, which means that heat will only be transferred and will not disappear. It is the operation law of microscopic space particles that constitutes the conservation of energy.

When the temperature of the object increases, the molecular thermal motion of the object will be strengthened, and the degree of space disturbance will be intense. This disturbance energy will be superimposed with the energy of space particles, thus increasing the energy of space particles.

When matter particles are in an environment with high-energy space particles, the gravitation and repulsion between space particles will be great, the thermal motion of the matter particles will be more intense, and the temperature of the material will be high. For example, the space particles on the inner layer of the earth and the surface of the sun have large energy, so their temperatures are very high.

The quenching process can be explained by the theory of space particles. When the temperature of the workpiece increases, the molecules of the workpiece vibrate violently at the equilibrium position. This vibration acts on the space particles and increases their energy. When the workpiece is rapidly cooled, it is equivalent to forcing the molecular vibration of the object to decelerate rapidly under the action of an external force. In this case, the energy of the space particles is not released. Just like when a spring vibrates an object, there's a sudden external force stopping the object from vibrating, the spring is likely to be in a stressed state in this case. This rapid cooling is equivalent to the use of an external force to promote the object molecules to increase the degree of intersection. The deeply intersecting molecules will form a stable structure, thus generating stress inside the workpiece.

10. Inertance

When an object is pushed on the ground to move forward, the space particles on the ground are bound by the earth's core and remain stationary with the ground. The particles of the moving object must collide with them. Since the collision of space particles is a completely elastic collision, the particles will bounce back after the collision. In this case, the object moves forward, and a more violent collision occurs. As a result, the particle obtains a greater rebound speed. When the particle moves forward at a greater speed, it will make the object move forward. In this way, the forward vibration distance of the particle is long and the backward vibration distance is short, thus forming a forward vibration state. As the object increases its speed, the collision intensifies, increasing the vibration frequency of the particle. Since the space particles are in a completely elastic state, when the thrust disappears, the oscillation frequency of the particles does not change, and the object particles are still in a state of forwarding vibration.

The essence of object motion is the interaction between space particles. Kinetic energy is stored in the interacting space particles in the form of object particle vibrations. This vibration is superimposed on the thermal motion of matter particles. This kind of vibration will form some particles as resistance, and other particles as thrust. The thrust will overcome the resistance, and the resistance will absorb energy to generate thrust, thus forming a dynamic cycle, so that the

object maintains the same state of motion. This is inertance. Both kinetic energy and thermal energy are the interaction result of space particles, but the space particles of kinetic energy interact in a single direction, and the essence of inertance is the conservation of energy.

11. Wave-Particle Duality

Similarly, when a single particle moves, the space particles around the particle store the kinetic energy of the movement, making the particle in a state of forwarding vibration. This is the wave property of particles. In the same state, the faster the particle movement, the greater the rebound force, and the higher the wave frequency of the particle, the shorter the wavelength. This is consistent with the experimental results that the greater the electric field force, the shorter the electron wavelength [7]. The movement of particles can be described by waves, which will not affect the properties of particles.

The essence of mass is energy density, which is the number of space particles per unit volume. When the energy in the center of an energy body increases, the volume of the space particles shrinks, the energy density increases, and the mass of the energy body increases. Space particles have a certain energy density, but there are both gravitation and repulsion between space particles, so space particles have no mass performance, and only when the energy density is greater than that of space can they have mass performance.

The energy of photons is superimposed with the energy of space particles, and the energy density within photons is greater than that of space, so photons have mass performance. Photons can be coupled with space particles in space for transmission, so there is a fixed propagation speed. A particle is an energy body, so it must have mass performance, and its motion is the movement of an energy body. There is no fixed speed. If photons have energy, they will definitely transmit to the outside. There are no photons without energy. So, photons have no prohibited state. When a photon does not have enough energy to effectively restrain the space particle, it will be in an oscillating state, and cannot form an energy body.

Regarding the explanation of the quantum double-slit interference experiment, electrons are hit on the screen one by one through the double slits, and fringes appear on the screen. The single electron does not interfere with itself. Since electrons are in a state of vibration, when the electrons accelerate forward and contact the screen, the screen particles gain energy to produce bright spots. When the electrons decelerate and retreat to contact the screen, the kinetic energy of the electrons is transferred to the surrounding space particles so that the screen cannot produce bright spots. The path is different, so the bright area means that the forward accelerated electrons have a high probability of showing on the screen. According to the theory of photon beams, it is impossible for photons to emit one by one. The light will deviate from a straight line when passing through the uneven space at the edge of the object. The center of the slit

is a uniform space. The light passing through cannot be deflected, and the interference disappears during observation. The quantum double-slit interference experiment uses wrong theories and wrong observation methods to get wrong observation results.

12. The Earth and the Sun

The formation principle of the earth and particles is the same. The earth is a large-scale energy body, the earth's core has huge energy. The earth's core has gravitation on the space particles bound. But there is a repulsion among the space particles. An object is an area with a high density of space particles, and the gravitation of the earth's core on the object is greater than the repulsion between the space particles, so the gravity of the object can be expressed.

An object is a large energy body made up of many small energy bodies (matter particles). The space particles in the object have two sources of energy, one is from the center of elementary particles, and the other is from the center of the celestial body. These two energies coexist dynamically so that the energy of space particles in the object is always greater than that of space particles in space. In addition, the space particles of the earth can also reach every corner of the object. Finally, the object is wrapped by the space particles of the earth.

After the object space particles leave the object, the energy decreases until it is equal to the energy of the space particles in the environmental space. The space particles of the object interact with the space particles of other objects in a coexistent state or a coupled state, thus generating universal gravitation. For the two objects, the closer the space particles, the greater the energy, and the greater the gravitation. The universal gravitation formula and Coulomb force are inversely proportional to the square of the distance because their carriers are all space particles, and both are the process of the electromagnetic field energy spreading into space.

The space particles in the ground space are constrained by the gravitation of the earth's core and remain still with the ground, which is the result of the Michelson-Morley experiment.

The sun is a larger-scale energy body, which constrains a larger range of space particles. The fluid on the surface of the sun is affected by planets to form a poor rotation, the center of the sun does not rotate. The space particles bound by the sun remain stationary with the center of the sun. The energy of the sun's space particles and the earth's space particles decreases with the increasing distance from the center. When they meet, the energy is equal, forming an area where the solar space particles and the earth space particles coexist. The energy of space particles in the area where the earth and the sun intersect on the front side is the largest. On the back of the earth, the energy of the space particles of the sun is weak, and the energy of the space particles of the earth is great. Because the energy bodies of the sun are very huge, the space particles of the sun are not easy to diffuse compared with the space particles of the earth. The energy of the

earth's space particles decreases rapidly as the distance increases. Eventually, the sun's space particles wrap the earth's space particles, forming a huge comet-tail-like intersection area, and the earth is bound by the sun.

Due to the rotation of the earth, the space particles of the sun and the space particles of the earth move relative to each other, thus generating a magnetic field in the same direction. This magnetic field is continuously superimposed to form a huge magnetosphere of the earth. The shape of the magnetosphere is exactly the shape of a comet's tail. In other words, the outermost magnetosphere is the area where the space particles of the earth and the space particles of the sun intersect and coexist.

In the solar system, every space particle bears the great pressure generated by the gravitation of the large-scale structure of the universe, which makes the space particles have huge energy. The energy difference between the space particles on the surface of the sun and the space particles on the outermost layer of the sun accounts for a small proportion of the total energy of the space particles. The energy of the space particles in the solar system is approximately equal, and the space of the solar system can be approximated as a uniform space. Consequently, the celestial bodies move according to the law of universal gravitation.

The approximately uniform space is not a uniform space. The space is still curved, but the degree of curvature is small. When light passes by the sun, modern physics describes it as a curvature similar to light refraction, which is actually the refraction of light. The problem of GPS jet lag is not only about air refraction, but also about space curvature.

13. Dark Matters and Cosmic Background Radiation

Under the premise that dark matters exist, the violation of Newton's universal gravitation in celestial observations can be well explained. Modern astronomy uses the movement of celestial bodies, Newton's universal gravitation, gravitational lensing, formation of large-scale cosmic structures, microwave background radiation and other observation results to indicate that dark matters may exist in galaxies [8], which coincides with the theory of space particles. The hypothetical dark matters are space particles.

The galaxy will constrain a wider range of space particles. There is a huge energy difference between the space particles in the inner and outer layers of the galaxy. It can no longer be ignored, and the space cannot be regarded as an approximately uniform space. Therefore, many celestial bodies will be observed to violate Newton's universal gravitation. When light passes through these uneven spaces, the light will be refracted, which will form a gravitational lensing effect. These phenomena are exactly what the theory of space particles should have in the universe.

Star clusters will also form intersections. They are connected by space particles, so there are both gravitation and repulsion between star clusters. The star clusters are connected to other star clusters, like iron chains, to form the spiral arms of the galaxy, constituting a huge galaxy. In the same way, there are gravi-

tation and repulsion between galaxies, forming the large-scale structure of the universe.

At the edge of the universe (or at the edge of the galaxies), due to the continuous weakening of the energy of space particles, an uneven space with a large enough scale will be formed. All the light will eventually be refracted, making the universe an ideal black body, which means that the heat released by the celestial bodies will be evenly distributed in the universe, thus forming the cosmic microwave background radiation.

Regarding pulsars, because the space particles in the inner layer of the galaxy have great energy, the space particles on the surface of the celestial body in the inner layer of the galaxy will have greater energy, making the celestial body radiate a strong magnetic field to form a pulsar.

14. Redshift and Cosmic Expansion

Space particles are equivalent to the propagation medium of light, and light is coupled to space particles for propagation. In the process of light coupling, the change in the volume of space particles will cause the Doppler effect of light.

During the coupling process between photon beams and space particles, the space particles are releasing energy. In this case, the volume of space particles is increasing, and the wavelength of photon beams also increases, resulting in the redshift of photon beams. Looking down at the earth over the North Pole, the space particles between the earth and the sun have the largest energy. The space particles bound by the earth rotate counterclockwise as the earth rotates, and the large-energy space particles are brought out, which will continue to release energy. When light passes through, redshift will occur. At this moment, the observed redshift cannot represent the movement of celestial bodies.

When the light source moves, it will hit the space particles in front, increasing the energy of the space particles in the front, and decreasing the energy of the space particles in the back. Therefore, the light in the front is blue-shifted, and the light in the back is red-shifted. In the universe, a certain celestial body on the edge of the galaxy releases energy to the outside of the galaxy, making these celestial bodies attracts each other. When the gravitation is greater than the gravitation between the galaxy and the celestial body, the celestial body will get rid of the constraints of the galaxy and fly to the universe, which is the same as the principle of element decay. At this time, the celestial body will have a redshift when it is observed from the galaxy.

The farther the two galaxies are, the smaller the energy of the space particles in the middle of them, the more the volume of space particles expands. The more the space particles expand, the smaller the energy, which will accelerate the expansion of the universe. The real cause of cosmic expansion is the expansion of space particles. The expansion of space particles is because the gravitation between two galaxies is smaller than the repulsion between space particles. On the contrary, the larger the energy, the more the space particles shrink, and the

more the space particles shrink, the greater the energy, thus forming celestial bodies in the universe.

In short, protons, neutrons, electrons, molecules, objects, celestial bodies, star clusters, galaxies, and the universe are all energy bodies, they just have different scales. Small energy bodies will be swallowed by large energy bodies. Only energy bodies of the same size will interact. The magnitude of the interaction depends on the depth of their intersection. The deeper the intersection of two energy bodies, the more stable their combination will be.

15. Theory of Relativity

The theory of relativity assumes that the speed of light is constant, which means that space does not change but time does. The objective situation is that since the energy and the volume of space particles are different, space is variable. Time changes have no support from the laws of physics, so time does not change. However, the description of space and time in these two ways is equivalent in the mathematical sense.

In other words, time expansion and space expansion of the theory of relativity is equivalent in the mathematical sense. The theory of relativity can make the conclusion correct to a certain extent by using the principle of equivalence to conduct a series of substitutions, such as the mass-energy relationship of the theory of relativity and the curvature of space-time. But it cannot be explained by the laws of physics, which is just a mathematical expression. The theory of space particles gives an explanation from classical physics. It has revealed the relationship between energy, mass, and space. Space is a physical phenomenon. The essence of the speed of light in a vacuum in the mass-energy relationship is the energy of space particles in the vacuum. In addition, the energy of space particles at different heights is different, which can affect the resonance frequency of atoms and make the atomic clock different.

Space particle theory is formed under the laws of physics, and the conclusion of space particle theory coincides with many physical phenomena. It explains the nature of photons and dark matter, and also explains the numerous physical phenomena. It is a continuation of classical physics, and all physical phenomena are easily understood under this theory, and the space particle theory is the perfect system of physical theory. Space particle theory has a rich connotation and is worth thinking about.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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