Clarifying the origin of the fine structure constant

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1. Overview

The fine structure constant is generally considered to be a coupling constant that represents the strength of the electromagnetic interaction of elementary particles, but its origin is unknown. I have discovered its origin using the energy body theory When the electron model of the energy body theory, which has a disk-like shape that rotates while expanding and contracting, interacts with another object, its base becomes distorted. This distortion produces a wave, which is kinetic energy, in the space in front of the electron. When this kinetic energy separates from the electron, it becomes called a photon. This photon has the same shape as the electron, reflecting the distortion angle of the foot. The fine structure constant originates from the distortion of the foot of this electron.

2. Derivation

2.1 Fine structure constant

The fine structure constant is:

$$\alpha = \frac{\mu_0 c e^2}{2h} = \frac{e^2}{4\pi\varepsilon_0 \hbar c}$$

Related equations

$$c^2 = \frac{1}{\mu_0 \varepsilon_0}, \qquad k_0 = c^2 \cdot 10^{-7} = \frac{\mu_0 c^2}{4\pi}, \ \ \mu_0 = 4\pi \cdot 10^{-7}, \hbar = \frac{h}{2\pi}$$

2.2 Particle model of energy body theory

When the energy cell bodies receive pressure from all directions of the celestial sphere, they contract to the limit. However, if the pressure is greater than this, the energy has nowhere to go and starts to rotate. On the other hand, the energy cell bodies that have contracted to the limit expand because the pressure is deflected. In this way, the pressure that was moving toward the center is instantly converted into rotational energy, so the expansion and contraction rotate as vibrations. It is important to note here that the entire elementary particle that is formed does not rotate around like a top. This rotation of energy appears as the crests and troughs of a wave like wrinkles extending radially from the center, and the phase shifts in the direction of rotation. This rotation of the wave is a de Broglie wave. This is the cause of the spin of elementary particles. Due to the balance with this gravitational field and their own spin, the energy cell bodies can continue to exist as elementary particles such as electrons and

protons.

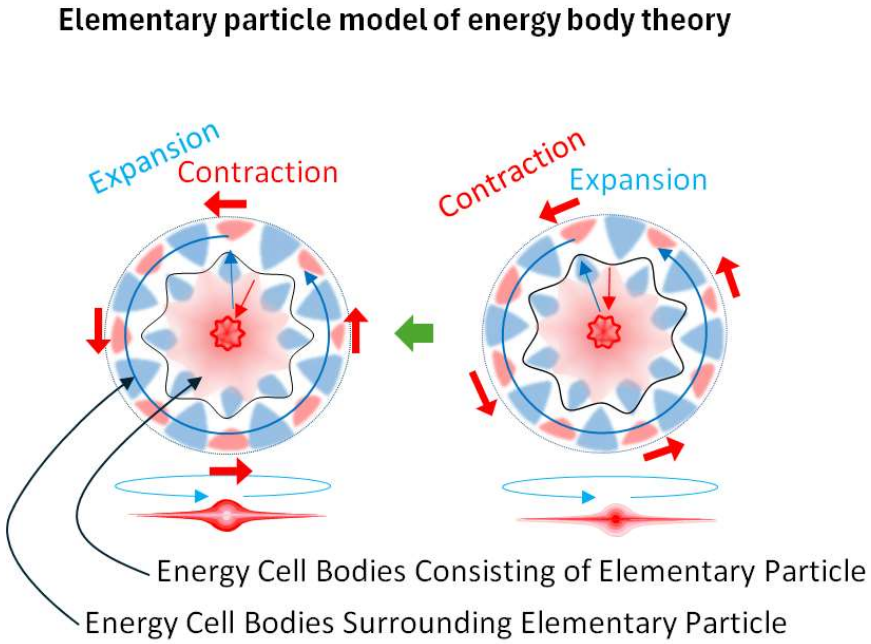

Fig.1

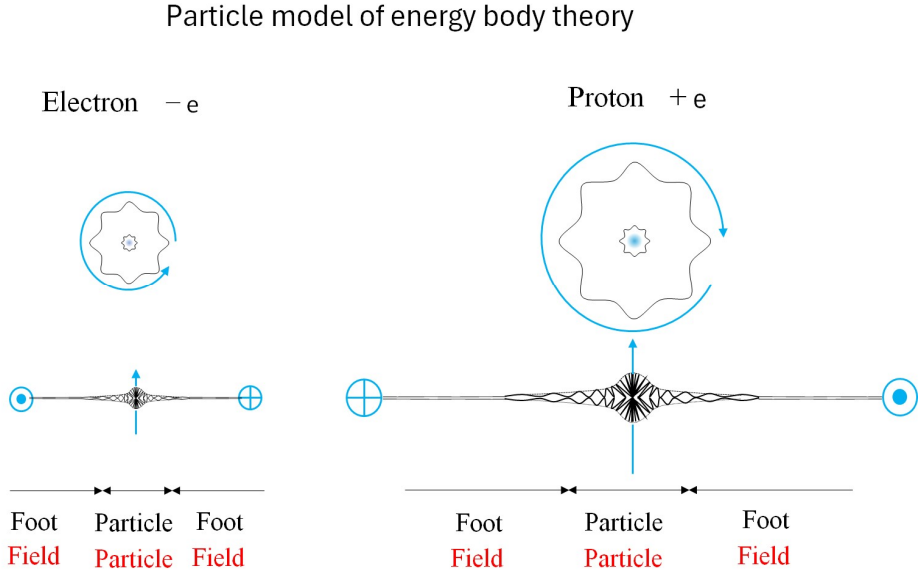

Fig.2

Electromagnetic interaction depends on the direction of the waves at the interaction; when the waves are in the same direction, an attractive force occurs, and when the waves are in opposite directions, a repulsive force occurs.

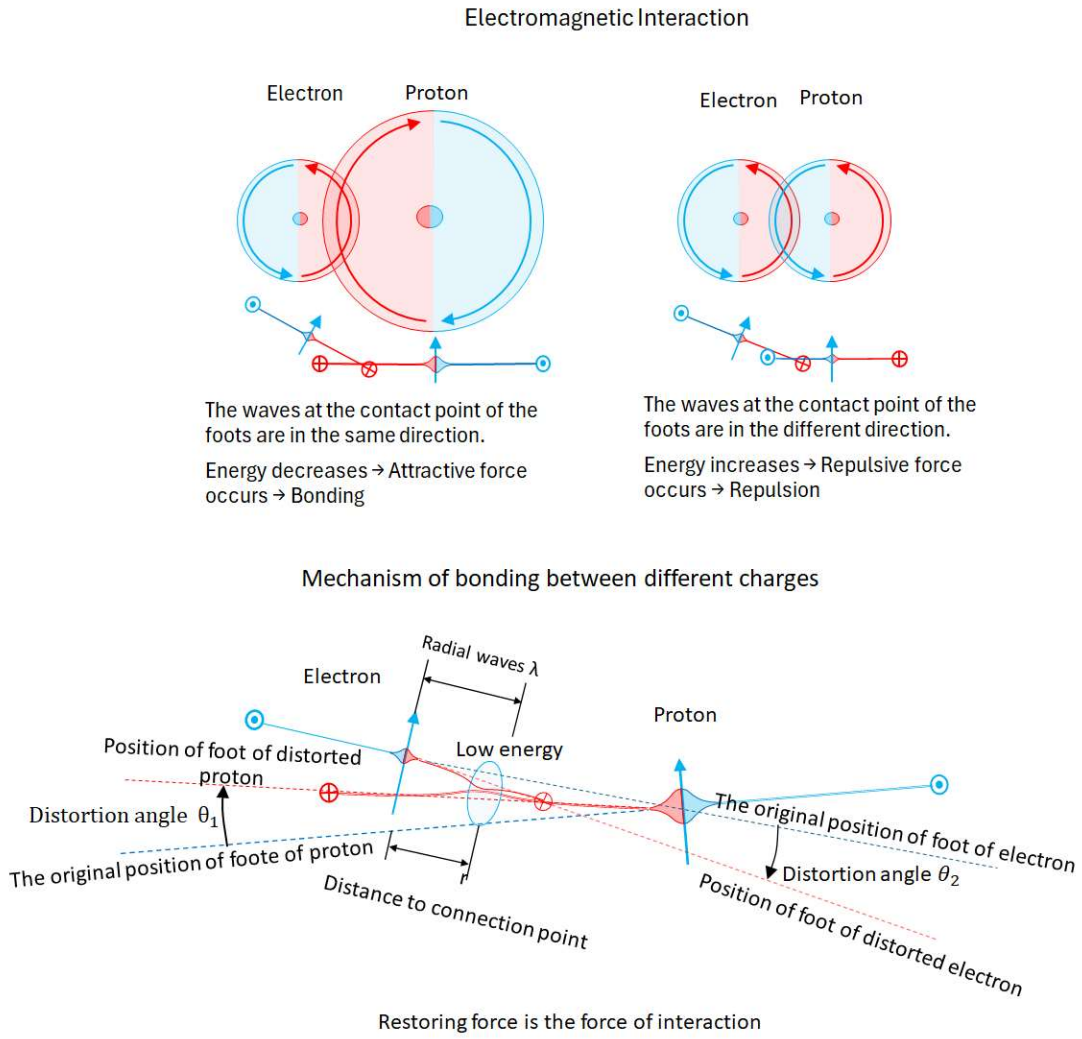

Fig.3

2.3 Fine structure constant

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Related Expressions

$$c^2 = \frac{1}{\mu_0 \varepsilon_0}, \qquad k_0 = c^2 \cdot 10^{-7} = \frac{\mu_0 c^2}{4\pi}, \quad \mu_0 = 4\pi \cdot 10^{-7}, \hbar = \frac{h}{2\pi}$$

2.4 Derivation

The fine structure constant is derived using the following method based on Figure.4 and 5. Note that the electron on the proton orbit is bound to the proton in the posture shown in Figure.4. When an excited state electron transitions to the ground state orbit, the base of the electron becomes distorted (negative energy), generating a wave of kinetic energy in the space in front of the electron. The electron is dragged along by this wave and moves. The kinetic energy that leaves the electron becomes a photon.

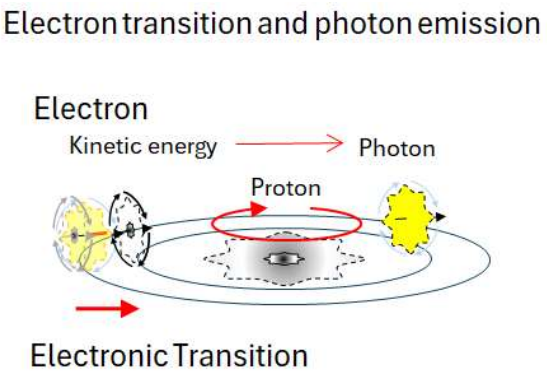

Fig.4

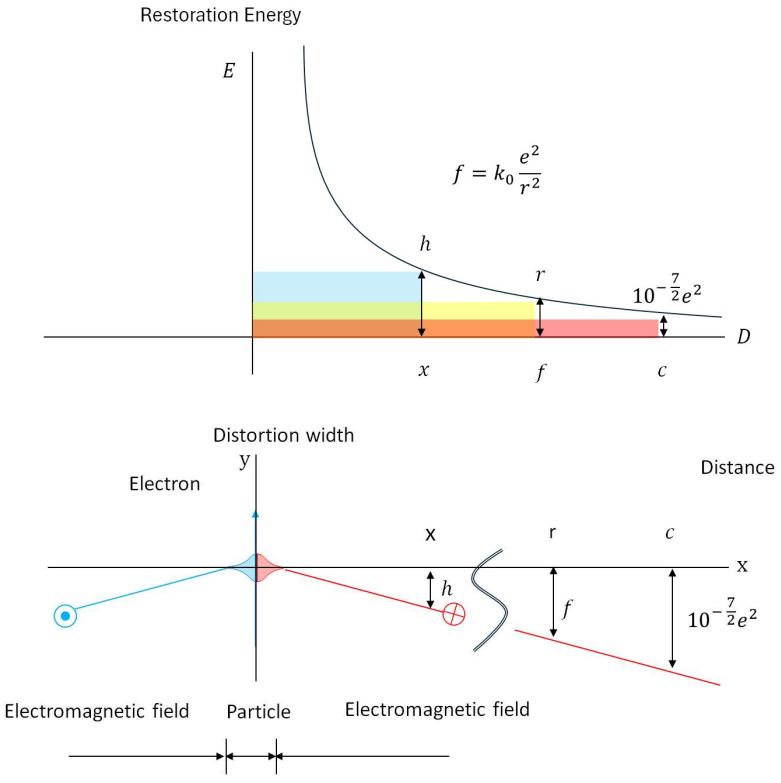

Fig.5

Planck's constant h, Coulomb's constant, and electromagnetic interaction are the effects by the distortion generated in the electron's foot and the restoration from that. Also, the speed of light is the ratio of the delay in time it takes for a photon's foot to reach an observer to the distance to the photon. This is because the arrival of the foot of light is delayed due to the photon's foot distortion observing the side perpendicular to the direction of travel of the photon. It is shown in Figure.6. The speed of the photon inherits the speed of the electron just before it is separated.

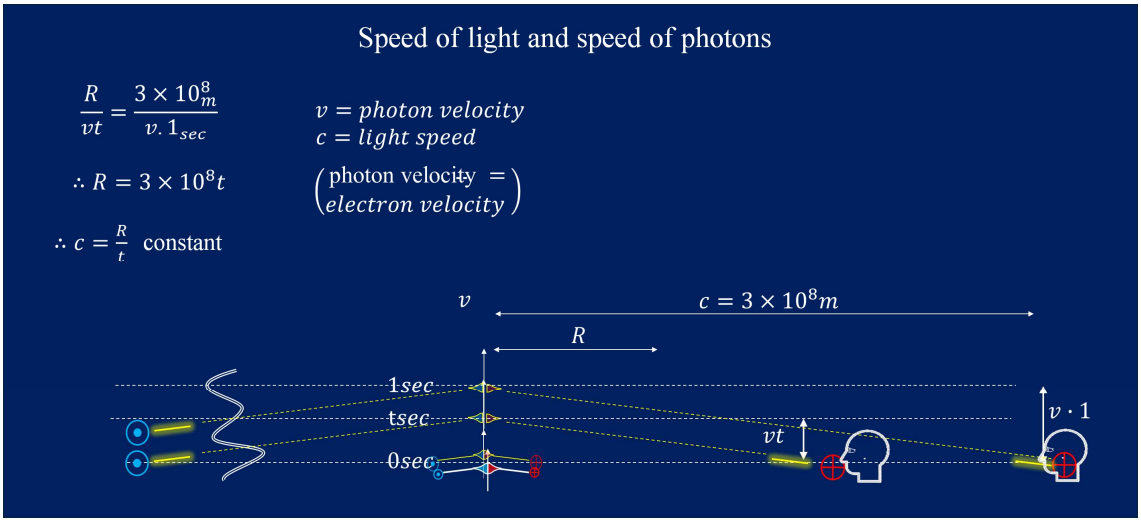

Fig.6

Let the position of the foot of an electron bound to a proton be x, its strength be h, the position of an arbitrary interaction be r, its strength be f, the position of the Coulomb constant be c, and its strength be $10^{-7}/_2 \cdot e^2$.

$$f = k_0 \frac{e^2}{r^2} \quad (1)$$

Here, $k_0 = 10^{-7} c^2$ so (1) becomes

$$f = 10^{-7} c^2 \cdot \frac{e^2}{r^2} \quad (2)$$

So, transform it and multiply both sides by π.

$$\pi r^2 f = \pi c^2 10^{-7} \cdot e^2 \quad (3)$$

The right-hand side of (3) is the energy E (constant) generated by the strain. Therefore,

$$\pi r^2 f = E \quad (4)$$

$$E = \pi c^2 10^{-7} \cdot e^2 \quad (5)$$

We have obtained the equation for the energy at position r.

From this, the energy at position x is given by (6).

$$\pi x^2 h = E \quad (6)$$

$$\pi x^2 h = \pi c^2 10^{-7} \cdot e^2 \quad (7)$$

$$\therefore \ x^2 = \frac{c^2 10^{-7} \cdot e^2}{h}$$

$$= \frac{c^2 \mu_0 \cdot e^2}{4\pi h} \quad (8)$$

Now, multiply both sides of (8) by $2\pi/c$.

$$\frac{2\pi x^2}{c} = \frac{c\mu_0 e^2}{2h} \quad (9)$$

$$\therefore \frac{2\pi x^2}{c} = \frac{e^2}{4\pi\varepsilon_0 \hbar c} \quad (10)$$

$$\alpha = \frac{2\pi x^2}{c} \quad (11)$$

$$\alpha = \frac{e^2}{4\pi\varepsilon_0 \hbar c} \quad (12)$$

The left-hand side (11) of (10) represents the ratio of the circumference of the electron's foot at position x to the distance traveled at the speed of light in one second.

The right-hand side (12) of (10) is the fine structure constant.

(Relationship between distortion of an electron foot and the fine structure constant)

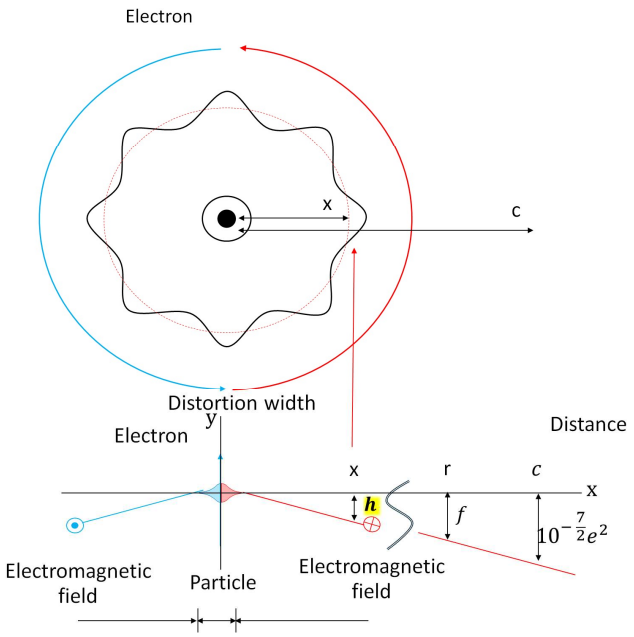

Fig.7

3. Conclusion

I have found that the fine structure constant originates from the distortion of the foot of the electron model of the energy body theory. I have also found that it is the ratio of the circumference of the foot of an electron at the point where the electron interacts to the distance traveled in one second at the speed of light.

4. 参照

4. Reference

Wikipedia; fine structure constant