Application of Congzi Force-Velocity Relativity Theory: Derivation of Quantum Radiation Formalism for Electrostatic Field Forces

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Abstract: The congzi force-velocity relativity demonstrates that force is the macroscopic manifestation of microscopic congzi momentum collisions through the analysis of momentum transfer between congzi particles. This study employs momentum transfer in the "congzi model" quantum number $n = N_0 t r_{e^2}/4R^2$ and momentum $\Delta Pe_2 = 2\mathrm{n} m_c c$ to establish the relationship between F_B and congzi kinetic energy. By equating quantum radiation energy $\mathrm{m}_c c^2/2 = h v_{v=1}$, it bridges electromagnetic interactions with quantum theory, interpreting macroscopic electrostatic force as a statistical outcome of microscopic congzi momentum exchange. The derivation maintains dimensional consistency, achieving unification between electromagnetic interactions and quantum theory through the bridge Small Moon constant *N₀*, which connects microscopic congzi collisions with macroscopic forces.

Key words: Congzi electric field force quantum radiation formula; Small moon constant N_0; Congzi chaotic field and Collision-gongying ordered field; Congzi force-velocity relativity

Introduction

In the proof of congzi force-velocity relativity, Cong Yongping proposed the classical static field force F_B and the true value force F_Z of the moving field in high-speed motion, It also demonstrated that the essence of the magnetic field is the relative effect of the velocity of the electric field force [1]. In the microscopic decomposition of macroscopic forces, it proved and derived the relativistic expression of the congzi force-velocity of the stable field [2] as follows:

$$congzi\ force\ velocity\ relativity \begin{cases} C\colon\ F_z^C = \left(1 - \dfrac{\Delta v}{c}\right)^2 F_B & (1) \\ Y\colon\ F_z^Y = \left(1 + \dfrac{\Delta v}{c}\right)^2 F_B & (2) \end{cases}$$

According to the congzi model, it can be predicted that: the electric force and gravitational force must be able to be expressed as the quantum radiation expression of congzi collisions.

This paper will derive the quantized radiation formula of the congzi electrostatic field force F_B from the source of force, without involving the ampere, elementary charge, or ε_0, namely:

$$\begin{cases} \text{Single charge}\colon\ F_B = N_0\ \dfrac{\hbar v_{v=1} r_e^2}{cR^2} & (3) \\ \text{Point charge}\colon\ F_B = N_0 n_1 n_2\ \dfrac{\hbar v_{v=1} r_e^2}{cR^2} & (4) \end{cases}$$

Among them, N_0 is the characteristic number of congzi radiated by a basic charge e per unit time, referred to as the 'Xiaoyue constant', approximately equal to 1.315×10^{43}/s ,at present, with the unit being: /s. h is Planck's constant; r_e is the electron radius; c is the speed of light; n_1 and n_2 are the numbers of fundamental charges at two points, respectively, R is the distance between the charges, that is, the radiation radius of the charges.

1 Microscopic Momentum Action Decomposition of the Electrostatic Field Force F_B Radiation Mechanism

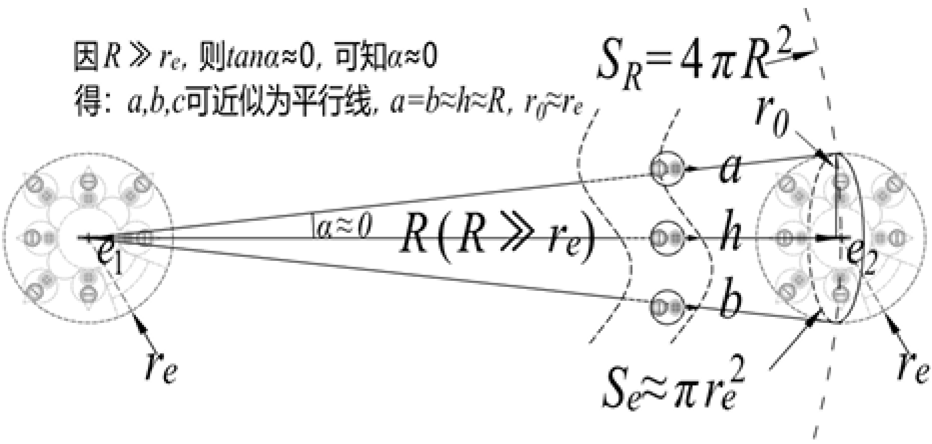

Figure 1 Illustration of the impulse effect of the electrostatic field between two charges

Figure 1 shows a microscopic decomposition schematic of the congzi impulse collision between two stationary charges e_1 and e_2. According to the congzi force-velocity relativity, in low-speed motion, for the sake of illustration convenience, the passive reflection and transmission of charges in the gongyi force field can be regarded as an active radiation force field. At this time, the force exerted by e_1 on e_2 is the static field force F_B. Let the cone generatrix of the radiation from e_1 to e_2 be a = b, the height be h, the angle between a and h be α, the base radius be r_0, the area of the base circle be S_e, the area of the radiation spherical surface at the point R of e_1's radiation radius be S_R, the electron radius be r_e, and the characteristic constant of the gongzi field intensity emitted by e_1 per unit time is N_0, with the unit being: /s.

2 The Derivation of the Formula for Electric Field Quantum Radiation

In modern physics, Ding Zhaozhong proved that the radius of an electron, r_e, is less than 10^{-16} meters,

In subsequent experiments over the next 40 years, it was further demonstrated that the electron radius $r_e < 10^{-19}$ m. Data from the Fermilab muon g^{-2} experiment indicate that if electrons (and leptons) have a composite structure, their radius must be limited to $r_e < 10^{-22}$ m [3]. In the atomic scale of typical conventional substances in nature, the Coulomb repulsion force between electrons prevents them from approaching infinitely. Combined with the quantum uncertainty principle, the minimum effective distance between two electrons is not less than 10^{-11} m.

This indicates that the electron radius in nature is much smaller than the distance between two electrons, that is, $r_e \ll R$.

From $r_e \ll R$, we know: $\theta = \arctan(r_e / R) \approx \arctan(0) = 0$.

Then a, b, h can be approximately regarded as parallel radiation lines of e_1 with respect to e_2. By geometry, it can be deduced that $r_0 \approx r_e$, and the projected base area of the radiation cone $S_e = \pi r_0^2 \approx \pi r_e^2$.

Then the gongzi number of quanta radiated from e_1 to e_2 in time t is：

$$n = N_0 t \frac{S_e}{S_R} = N_0 t \frac{N_0 t r_e^2}{4\pi R^2} = \frac{N_0 t r_e^2}{4R^2} \qquad (5)$$

The electronic radius is much larger than the congzi radius, that is, $r_e \gg r_c$. According to the congzi collision model, all the gongzi within the radiation cone are regarded as positive collisions with e_2. Also, $m_e \gg m_c$. At t ≈ 0, by using the conservation of momentum and kinetic energy, it is obtained that the gongzi is approximately reflected at $-c$. Then, the momentum increment of e_2 within t time is:

$$\Delta P_{e_2} = n[m_c c - (-m_c c)] = \frac{1}{2} N_0 t \frac{m_c c r_e^2}{R^2} \qquad (6)$$

Then the static field force F_B exerted by e_1 on e_2 can be expressed as:

$$F_B = \frac{\Delta P_{e_2}}{t} = \frac{1}{2} N_0 \frac{m_c c r_e^2}{R^2} \qquad (7)$$

From the modeling of congzi relativistic theory, it can be seen that the default kinetic energy of one congzi is equal to the energy of a photon with one frequency, that is:

$$\frac{1}{2} m_c c^2 = h_{v_{v=1}} \qquad (8)$$

Calculate the absolute mass of the congzi m_c to:

$$m_c = \frac{2\mathrm{h} v_{v=1}}{c^2} \approx 1.4745 \times 10^{-50}\ \mathrm{kg} \qquad (9)$$

Substituting the congzi mass $m_c = 2\mathrm{h} v_{v=1}/c^2$ in equation (9) into equation (7), we obtain:

$$F_B = N_0 \frac{h_{v_{v=1}} r_e^2}{c R^2} \qquad (10)$$

From equation (10), it can be seen that $N_0 \mathrm{h} v_{v=1}/c$ is a constant, indicating that F_B is inversely proportional to the square of the distance R. Equation (10) is the congzi quantumized radiation expression for the electrostatic field force between basic charges, which is $F = e^2/(4\pi\varepsilon_0 R^2)$.

3 Derivation of the Formula for Quantum Radiation of the Electric Field of a Conventional Point Charge

As shown in Figure 2, the distance between point charge Q and q is R, where $R >> r_Q$ and $R >> r_q$, $Q = n_1 e$ and $q = n_2 e$.

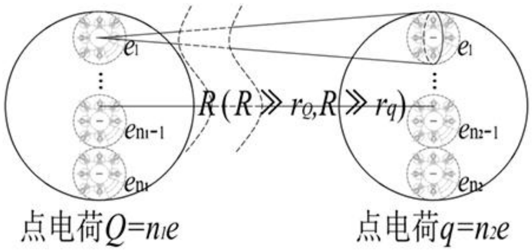

Figure 2 Schematic diagram of the quantum radiation principle of electric field forces between point charges Q and q

It can be known from the derivation of the quantum radiation form of the electrostatic force above that: the quantum radiation formula of e_1 in the point charge Q acting on each electron e in the point charge q can all be written as:

$$F_{B(e_1\to e)} = N_0 \frac{h_{v_{v=1}} r_e^2}{cR^2}$$

Then the quantum radiation formula of the electrostatic force exerted by e_1 on the n_2 electrons e in q can be written as：

$$F_{B(e_1\to q)} = n_2 F_{B(e_1\to e)} = N_0 n_2 \frac{h_{v_{v=1}} r_e^2}{cR^2} \qquad (11)$$

Then the quantum radiation formula of the electrostatic force exerted by the n_1 electrons e in Q on q can be written as:

$$F_{B(Q\to q)} = n_1 F_{B(e_1\to q)} = N_0 n_1 n_2 \frac{h_{v_{v=1}} r_e^2}{cR^2} \qquad (12)$$

Equation (12) $F_B = N_0 n_1 n_2 \frac{h_{v_{v=1}} r_e^2}{cR^2}$ represents the expression for the quantum radiation of the electrostatic field force between two point charges Q and q.

Similarly, based on the congzi collision-gongying ordered model, the quantum radiation form of the electrostatic field force between $-e$ and $\pm e$ can be derived.

4 The physical meaning of the expression for the Quantum Radiation of the Electrostatic Field

4.1 Reveals the radiation principle of electric charge and electric field

$$\begin{cases} \text{Single charge: Radiation} F_B = \dfrac{N_0 \text{h} v_{v=1} r_e^2}{c} \dfrac{1}{R^2} \quad \text{Classics} \quad F = \dfrac{e^2}{4\pi\varepsilon_0} \dfrac{1}{R^2} \\ \text{Point charge: Radiation} F_B = \dfrac{N_0 \text{h} v_{v=1} r_e^2}{c} \dfrac{n_1 n_2}{R^2} \quad \text{Classics} \quad F = \dfrac{1}{4\pi\varepsilon_0} \dfrac{Qq}{R^2} \end{cases}$$

By comparing the above equations, it can be seen that: the formula for quantum radiation of congzi electrostatic field is a dimensionless expression derived directly from the principle of photon radiation, without involving any electric charge. The basic electric charge radiation expression is only inversely proportional to the square of the distance of the charge, which not only conforms to the classical description of electric field force but also reveals the principle of electric field radiation.

The expression for the point charge radiation is inversely proportional to the square of the distance between the point charge, and directly proportional to the number of fundamental charges in the point charge. And the number of charges is directly proportional to the radiation intensity $n_1 F_{B(e_1 \to q)}$ of the radiation source and the projected area $n_2 S_{e\ \text{Projection}}$ of the radiated object (that is, proportional to $n_2 re^2$), which further reveals the principle of electric field radiation, that is, $F \propto n_1 n_2 S_{e\ \text{Projection}} / R^2$.

Conclusion: In the expression for quantum radiation of the electrostatic field, n_1 determines the radiation intensity of Q, n_2 determines the radiation receiving area of q, and R^{-2} determines the surface density of radiation quanta. This formula reveals that the various physical characteristics of charge are the macroscopic manifestations of microscopic congzi momentum collisions in electromagnetism.

4.2 Innovatively explained the microscopic mechanism of electric field force

The quantum radiation expression of electrostatic field force successfully eliminates the fundamental charge e and the charge dimension of ε_0 through Planck constant, the speed of light, quantum number N_0, n_1, and n_2. Its formula and derivation process provide a clear and innovative explanation from the perspective of quantum radiation about the essence of charge and electric field force, offering a new way of understanding the microscopic operation mechanism of electric field force.

The quantum radiation expression of electrostatic field force, which is entirely based on the congzi theory, provides a novel and self-contained theoretical foundation for the cutting-edge scientific research in the field of electric field quantum radiation.

4.3 The first bridging of classical macroscopic forces and quantum theory

This formula describes the radiation mechanism of electrostatic field forces by introducing quantumization conditions (such as the gongzi momentum exchange model), combining the $F \propto R^{-2}$ characteristic of Coulomb's law with the energy transfer process $E \propto R^{-2}$ of quantum radiation, providing a new perspective on the microscopic quantum origin of static field forces.

The microscopic mechanism of force reveals that formulas (3) and (4) interpret the electrostatic field force as the congzi momentum transmission effect of N_0 elementary charges radiating per unit time, achieving the direct correlation between macroscopic force and quantized energy exchange for the first time.

Among them, the $N_0 h_{v_{v=1}} r_e^2/c$ form constitutes the action quantum, indicating that the electromagnetic interaction has a discrete nature. This model reveals the quantum correction mechanism of the traditional Coulomb force formula $F = qE$ at the microscopic scale.

4.4 Continuity disruption and discretization expression

In the formula, by quantifying the number N_0 of radiation particles, a discrete description of the effect of the electric field is achieved, breaking through the limitations of the continuous medium assumption in classical field theory and forming an intrinsic correspondence with the principle of quantum mechanical state superposition.

4.5 The quantization extension of electromagnetic fields

The microscopic momentum exchange mechanism involved in the derivation of this formula can be regarded as a supplement to the quantization path of Maxwell's electromagnetic theory. Referring to the theoretical framework of quantized photons of electromagnetic waves, this formula implies that the electrostatic field also has a quantumized characteristic similar to the "virtual photon" transmission effect.

4.6 Eliminate the phenomenological parameters in the classical theory

By introducing the congzi radiation model, the quantum radiation formula of electrostatic field overcomes the dependence on the vacuum dielectric constant being ε_0 and the fundamental charge *e*, attributing the electromagnetic interaction to more fundamental quantum fluctuations of spacetime (characterized by N_0), which is in line with the idea of "vacuum as the medium" in quantum field theory.

4.7 Completed the electromagnetic force expression of the congzi force relativistic theory

The derivation process of this formula in the microscopic domain has further refined the electromagnetic force expression of the congzi force theory:

$$\begin{cases} C\text{:}\ \ F_z^C = N_0 n_1 n_2 \dfrac{h_{v_{v=1}} r_e^2}{cR^2}\left(1-\dfrac{\Delta v}{c}\right)^2 \\ Y\text{:}\ \ F_z^Y = N_0 n_1 n_2 \dfrac{h_{v_{v=1}} r_e^2}{cR^2}\left(1+\dfrac{\Delta v}{c}\right)^2 \end{cases}$$

The derivation of the formula for quantum radiation in electrostatic fields provides a crucial mathematical validation for the theory of congzi forces in relativity, especially in terms of the unification of micro and macro forces and the correlation of parameters, which is highly persuasive.

4.8 N_0 may be used to derive the basic charge radius and the density of dark matter

From the expression of the electrostatic field force radiated by the elementary charge being equal to the classical electric field force $F_B = N_0 h_{v_{v=1}} r_e^2 / cR^2 = e^2/(4\pi\varepsilon_0 R^2)$, we can obtain:

$$r_e = e\sqrt{c \,/\, \left(4\pi\varepsilon_0 N_0 h_{v_{v=1}}\right)}$$

$$N_0 = ce^2 \,/\, 4\pi\varepsilon_0 h_{v_{v=1}} r_e^2$$

From the above derivation, it is clear that the electron radius is not only determined by quantum mechanics' h and electromagnetism's *e*, ε_0, but also related to the intensity of the congzi radiation N_0, suggesting that the electron has a more microscopic radiation structure. This equation further strengthens the congzi model's quantum explanation of electromagnetic interactions, providing new ideas for exploring the internal structure of fundamental particles. The microscopic source of the vacuum dielectric constant ε_0 is associated with N_0, supporting the view that the vacuum is a medium of quantum fluctuations.

The solution for N_0 is directly related to the number of congzi of elementary charges colliding within a unit of time, which involves the density and mass of dark matter in the universe and space-time. The precise solution for N_0 will be discussed separately in a subsequent paper.

5 Application Scenario Exploration

5.1 Precision measurement technology

The quantum radiation model provides theoretical support for the precise measurement of static electric forces at the nanoscale. For instance, in scanning probe microscopy, the atomic-level surface charge distribution can be used to calculate the quantum perturbation effect of the probe.

5.2 New device design

By taking into account the frequency correlation of the radiation process, the charge control accuracy of nano-electronic components such as quantum dot devices and single-electron transistors can be optimized, and the design errors caused by ignoring quantum fluctuations in classical theory can be reduced.

5.3 Verification of fundamental theories

The R^{-2} dependence implicit in the formula is consistent with the classical Coulomb law, providing a verification method for the validity of quantum field theory in the case of long-range forces. At the same time, its possible short-range correction terms can serve as experimental targets for probing the effects of quantum gravity.

5.4 Innovation in energy conversion mechanism

By quantifying the energy transfer efficiency during the radiation process, a computational framework is provided for optimizing the quantum efficiency of electrostatic energy storage devices and for developing new energy harvesting technologies (such as quantum friction power generation).

6 Theoretical Expansion Direction

The proposal of the formula for quantum radiation in electrostatic fields marks a paradigm shift from the description of static fields to the description of dynamic quantum interactions. However, it still requires empirical verification through experiments such as low-temperature single-electron manipulation or superconducting quantum interference measurements. In the future, it may give rise to new technologies for information storage and energy transmission based on quantum electrostatic forces, as shown in Table 1.

Table 1: The expansion direction of quantum radiation theory based on the impact of Gongyi field impulse

Research Direction	Potential breakthrough point	Theoretical basis
Quantum vacuum	Virtual particle pairs at rest	Reference: QED
Fluctuation coupling	Correction of electric field force	Vacuum polarization effect
Non-equilibrium state	Establish the duration of time	Combining with Zhan Ding
Field force dynamics	Sub-radiation model	Gao - Image Evolution
Topological field	Introduce topological invariants	Analogous to Landau
Quantization	Describe the radiation path of the electromagnetic field	Energy level theory

7 Analogy analysis of the expression of Gravitational Radiation in Quantum Mechanics

The law of universal gravitation can also be derived from the quantum radiation model of the electrostatic field. However, due to the complex mechanism of its action involving the relativistic motion field of the congzi force, the proof is rather complicated. This can be further explored separately in the future.

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