Regarding the elementary charge and the fine-structure constant

We mentioned earlier: After defining "stationary state, spherical symmetry" and the handwritten epsilon and Mu, it can be self-consistently derived that:

The specific calculation of Psi (r) is as follows

$$\nabla_\mu\left(\frac{1}{\mu_{(r)}}F^{\mu v}\right)=0$$

In a spherically symmetric spacetime (depending only on the radial coordinate r), by expanding it into the conservation of radial components (taking ν = r as an example), describe the conservation of the radial "electromagnetic-like current" ：

$$\frac{1}{r^2}\frac{\partial}{\partial r}\left(r^2\cdot\frac{1}{\mu_{(r)}}F^{0r}\right)+Angular\ term=0$$

Due to spherical symmetry, the angular term is 0, so the core equation is:

$$\frac{\partial}{\partial r}\left(r^2\cdot\frac{1}{\mu_{(r)}}F^{0r}\right)=0$$

The "electric field-like" Psi and the time-radial component of the electromagnetic field tensor, capital F raised to the ...th power 0 r, satisfy:

$$F^{0r}=\frac{\psi}{c}$$

$$\frac{\partial}{\partial r}\left(r^2\cdot\frac{1}{\mu_{(r)}}\frac{\psi}{c}\right)=0$$

Since the derivative is 0, the term in the parentheses is a constant (denoted as K):

$$\psi(r)=\frac{kC\mu_{(r)}}{r^2}\qquad(4.1)$$

$$It\ is\ known\ from:\qquad\mu=-\frac{1}{c}\frac{B}{\psi}$$

that $\mu_{(r)}=-\frac{1}{C}\frac{B_{(r)}}{\psi(r)}$ ， $B_{(r)}=-c\psi(r)\mu_{(r)}=\frac{kC^2}{r^2}\mu_{(r)}{}^2$

$It\ is\ known\ from$:： $\lambda=-\frac{1}{2\mu_{(r)}}(B^2-\frac{\psi^2}{C^2})=k_3\frac{G}{C^4}$ （k_3为比例系数）

that： $-\frac{1}{2\mu_{(r)}}\left(\left(\frac{kC^2}{r^2}\mu_{(r)}{}^2\right)^2-\frac{1}{C^2}\left(\frac{kC\mu_{(r)}}{r^2}\right)^2\right)=k_3\frac{G}{C^4}$

$$-\frac{1}{2\mu_{(r)}}\left(\frac{k^2C^4}{r^4}\mu_{(r)}^4-\frac{1}{C^2}\frac{k^2C^4\mu_{(r)}^2}{r^4}\right)=k_3\frac{G}{C^4}\qquad(4.1)$$

$$\mu_{(r)}\approx\frac{1}{C}$$

Rewrite equation (4.1) as: $\psi(r) = \frac{kC\mu_0}{r^2} = \frac{k}{r^2\varepsilon_0 c} = \frac{4\pi\hbar k/r^2}{4\pi\varepsilon_0\hbar c}$

Let: $k_1 = 4\pi\hbar k$ get: $\psi(r) = \frac{k_1/r^2}{4\pi\varepsilon_0\hbar c}$

We regard the elementary charge e as "the number of spatial displacement vector lines passing through a unit solid angle per unit time", and its mathematical expression is

q $= k' \frac{\mathrm{d}m}{\mathrm{d}t} = -k' k \frac{\mathrm{d}\Omega}{\mathrm{d}\tau} / \Omega^2$ (Ω Solid angle for spatial rotation)。

Integrate it: $Q = \int q d_t = \frac{k' k}{\Omega}$ Then the uppercase Q is the charge within (t_0, t)

$\psi = \psi_{(r,\theta,\phi,t)}$, Let the surface area of the sphere be S, then $\Omega = \frac{S}{r^2}$

$\psi(r) = \frac{k_1/r^2}{4\pi\varepsilon_0\hbar c} = \frac{k_1 \frac{1}{S} Q}{4\pi\varepsilon_0\hbar c}$

This $k_1 \frac{1}{S} Q = 4\pi\hbar k \frac{1}{S} Q$ It is the number of charges per unit area, and we define this thing as e^2:

$\mathrm{e}^2 = 4\pi\hbar k \frac{1}{S} Q$

that is: $\psi(r) = \frac{e^2}{4\pi\varepsilon_0\hbar c}$

Here, "solid angle (uppercase Omega)" and "angular velocity $\frac{\mathrm{d}\Omega}{\mathrm{d}\tau}$ " are essentially quantitative descriptions of the spatial geometric structure (the angular distribution of spiral motion) — that is to say, the magnitude of e is directly determined by the structural parameters of the spatial spiral motion. "Charge" also no longer serves as a fundamental dimension.

then $\psi(r) = \frac{e^2}{4\pi\varepsilon_0\hbar c} = \alpha$ This is the fine-structure constant

Now I need to calculate it specifically.: $\mu_{(r)} \approx \frac{1}{C}$

From equation (4.1), we have: $-\frac{k^2 C^4}{2r^4}\mu_{(r)}\left(\mu_{(r)}^2 - \frac{1}{C^2}\right) = k_3 \frac{G}{C^4}$

Order: $A = \frac{1}{C^2}$ B=$-\frac{2k_3Gr^4}{k^2c^8}$

get it: $\mu_{(r)}^3 - A\mu_{(r)} - B = 0$

get it: $\mu_{(r)} = \sqrt[3]{-\frac{k_3Gr^4}{k^2c^8} + \sqrt{\left(\frac{k_3Gr^4}{k^2c^8}\right)^2 - \frac{1}{27c^6}}} + \sqrt[3]{-\frac{k_3Gr^4}{k^2c^8} - \sqrt{\left(\frac{k_3Gr^4}{k^2c^8}\right)^2 - \frac{1}{27c^6}}}$

Step 1: Analyze the order of magnitude of parameters (taking the solar physics scenario as an example)

In astrophysics, when considering situations related to gravity, the order of magnitude of G (the gravitational constant) is 10^{-11}, c (speed of light) is on the order of 10... to the power of one to eight 10^8, r (such as the radius of a celestial body) is of the order of magnitude of $6.69 \times 10^8\, m$, k(For constants related to matter, if they are associated with the energy-momentum tensor, they can be approximately considered to be related to density, and their order of magnitude can be regarded as around 1), k_3 is a constant (its order of magnitude can be regarded as 1)

$\frac{k_3Gr^4}{k^2c^8} \approx 10^{-35}$

Step 2: Approximate the cubic equation

A cubic equation is

$\mu_{(r)}^3 - \frac{1}{C^2}\mu_{(r)} = -\frac{2k_3Gr^4}{k^2c^8}$,

because of $-\frac{2k_3Gr^4}{k^2c^8}$ The order of magnitude is extremely small, so it can be assumed $\mu_{(r)}$ Approximately a quantity related to $\frac{1}{C}$, Let $\mu_{(r)} = \frac{a}{c} + \delta$, Among them δ is much smaller than $\frac{a}{c}$ 。

Substitute $\frac{a}{c} + \delta$ into the equation:

$\left(\frac{a}{c} + \delta\right)^3$ - $\frac{1}{C^2}\left(\frac{a}{c} + \delta\right) \approx \frac{2k_3Gr^4}{k^2c^8}$

To make the numerator $\frac{a^3-a}{c^3}$ This term balances higher-order small quantities, Let $a^3 - a$, The solution is obtained as follows: a = 0 or a = 1 or a=-1。

Since physically, the subscript of $\mu_{(r)}$ should be positive, taking a = 1, then

$$\delta \times \frac{2}{C^2} \approx -\frac{2k_3Gr^4}{k^2C^8}$$

Step 3: Obtain approximate results

$\mu_{(r)} \approx \frac{1}{c} - \frac{2k_3Gr^4}{k^2c^6} \approx \frac{1}{c}$

Now, we have: Let $e^2 = k_0^2 / r^2$

then $\psi(r) = \frac{e^2}{4\pi\varepsilon_0\hbar c}$ = α This is the fine-structure constant.

This paper discusses and presents the origins of electric charge and the fine-structure constant, which may be correct. Because it conforms to the generalized norms:

1. Covariance
2. Renormalizability