The relation between the resting mass and the radius of the proton

HuangShan

(Wuhu Institute of Technology, China, Wuhu, 241003)

Abstract: The rest mass of the proton and the rest mass of the electron can be expressed by the radius of the proton and the radius of the electron.

Key words: Radius of proton, Proton rest mass, Radius of electron, Electron rest mass.

First of all, our consensus is this equation, that is, $\frac{(m_e)(R_\infty)(G_N)}{(a_0)} = 2\pi(m_e)[\alpha_o](c)$,

Then, we know that $(r_e) = [\alpha_o]^2(a_0) \Longrightarrow (G_N) = \frac{2\pi(r_e)(c)}{[\alpha_o](R_\infty)}$,

And then I found out that there could be,

$$\frac{1}{2}(m_e)[\alpha_o]^2(c)^2 = \frac{(G_N)(r_e)(r_{am})(2\pi)^2}{(a_0)^2} \Longrightarrow \frac{1}{2}(m_e)(c)^2 = \frac{(G_N)(r_{am})(2\pi)^2}{(a_0)}$$

$$\Longrightarrow \frac{1}{2}(m_e)(c)^2 = \frac{(2\pi)^3[\alpha_o](c)(r_{am})}{(R_\infty)}$$

And because I wrote two equations before, that is,

$$\begin{cases} \frac{(m_e)(m_{atom})(G_N)}{(a_0)^2} = (2\pi)^3(m_e)(e_o) \ , \\ \frac{1}{2}(m_e)[\alpha_o]^2(c)^2 = \frac{(m_{atom})(c)^2}{2\pi(R_\infty)} \ , \end{cases}$$

So, there can be,

$$\frac{(m_{atom})(c)^2}{(R_\infty)} = \frac{(G_N)(r_e)(r_{am})(2\pi)^3}{(a_0)^2} \Longrightarrow (m_{atom})(c)^2 = \frac{[\alpha_o](c)(r_e)(r_{am})(2\pi)^4}{(a_0)}$$

So, from the equation above, that is, mass can be expressed in space,

That is,

$$\begin{cases} (m_{atom})(c)^2(a_0) = [\alpha_o](c)(r_e)(r_{am})(2\pi)^4 \ , \\ \frac{1}{4}(m_e)(c)^2 = (c)(r_{am})(a_0)(2\pi)^4 \ , \end{cases}$$

Where (c) is the Speed of light, (e_o) is the Elementary charge, $[\alpha_o]$ is the Fine structure constant, (R_∞) is the Rydberg constant, (a_o) is the Bohr radius, (m_{atom}) is the Basic atomic mass, (m_e) is the Electron rest mass, (G_N) is the Gravitational constant, (r_e) is the Radius of electron, (r_{am}) is the Radius of proton.

Reference: https://doi.org/10.5281/zenodo.4779601.