Connecting fundamental constants….

The gravitational to the electric force ratio in an electron is numerically close to Planck time

$$F_g / F_e \approx t_p$$

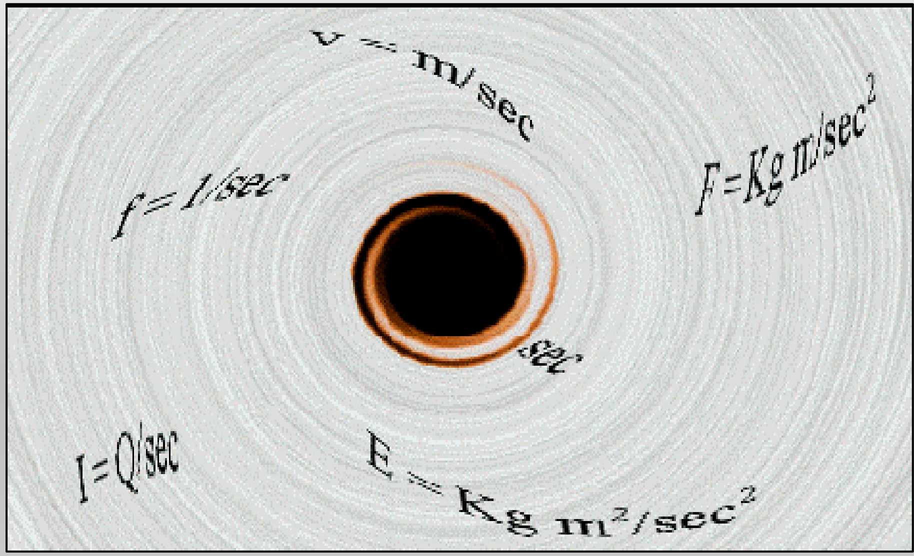
The difference is about 0.2%

Planck time t_p is $2^{1/2}\pi$ larger than the accepted value

There is an apparent time dimension mismatch

Is this just a coincidence or rather the manifestation of an underlying structure involving a black hole?

Connecting Fundamental Constants



$$G M^2 = Q^2 / 4 \pi \varepsilon_0$$

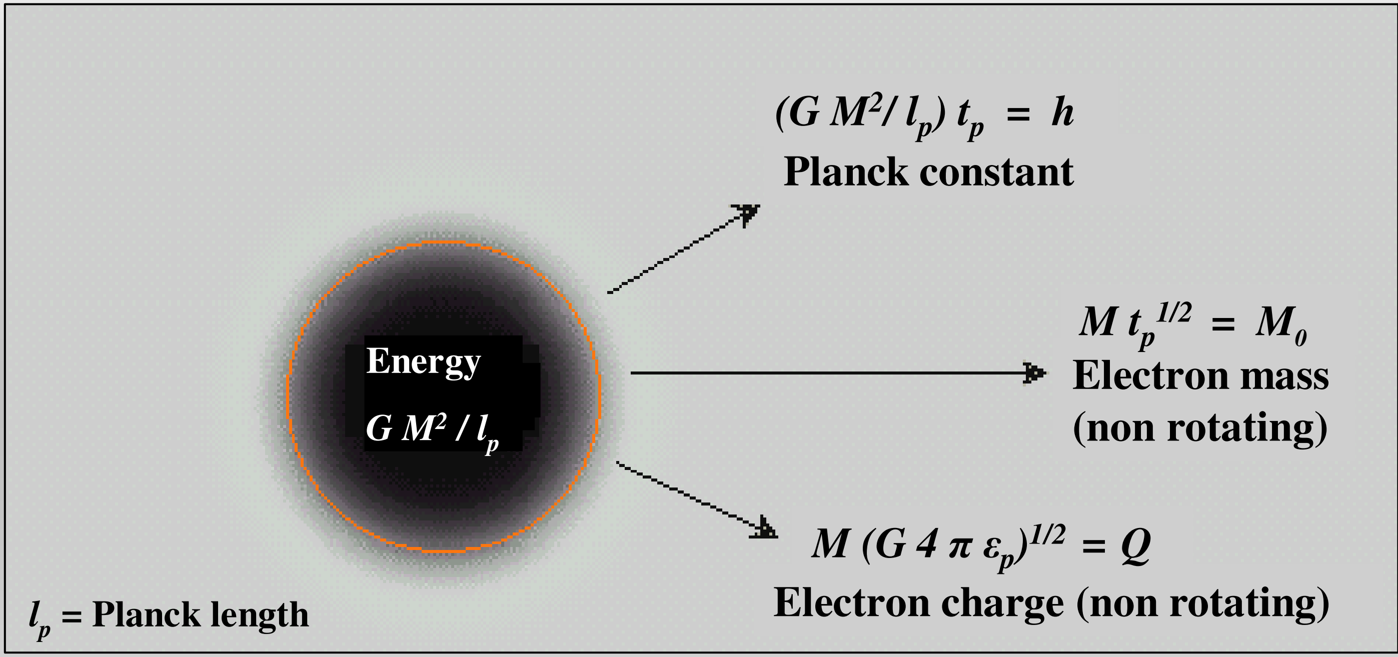
$$\varepsilon_p = (t_p / 4 \pi^2)^{1/4}$$

$$t_p = G M_0^2 / G M$$

M = Planck mass t_p = Planck time M_0 = measurable Planck mass

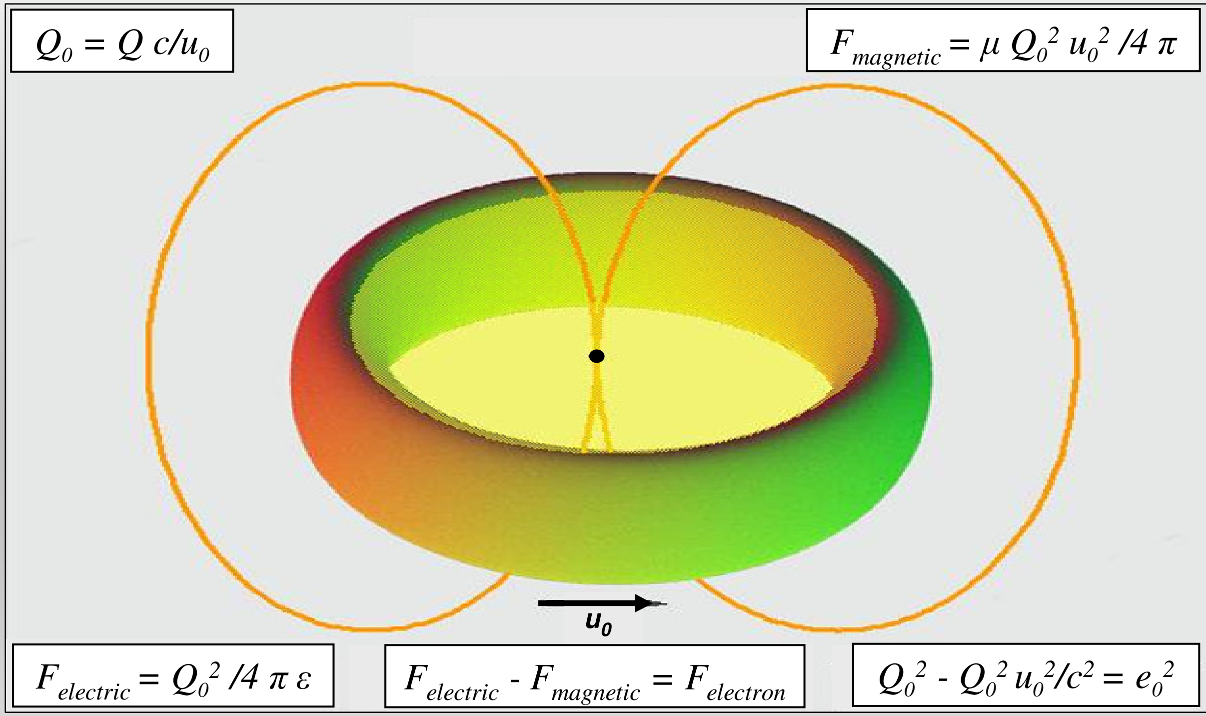
In a black hole time loses its meaning. Past the event horizon the time dilation might "freeze" the way it appears to us. Outside the black hole, the gravitational force GM_0^2 has a time dimension, the Planck time, which we are unable to detect.

Origin of Electron



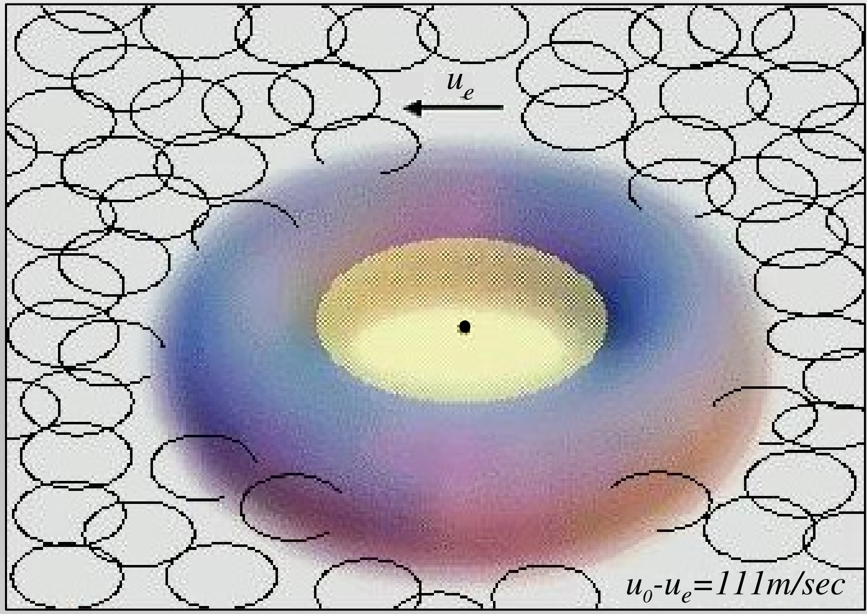
The energy of the Planck black hole is given by GM^2/l_p, but the constrain of time t_p outside the black hole would give us something slightly different, the Planck constant, the measurable mass $Mt_p^{1/2}$ and the electric charge, where ε_p is the Planck permittivity.

The Spinning Particle



A rotating charge will set up a magnetic field opposing its own rotation until a stability point is reached. The rotational speed u_0 is related to the initial fine structure constant $\alpha_0=2(1-u_0^2/c^2)$. α_0 would depend on some electrical properties of the particle and how charge Q compares with a ring of unitary charge Q_u and unitary time t_u so that $\alpha_0 = (W_u/W_p)^{1/2}$ where $W_u=16\pi^4 Q_u^2/t_u$ and $W_p=Q^2/t_p$.

Rotation Slowdown by Virtual Particles



Vacuum equation

$$\alpha^3 - 2\alpha^2 + 10^{-7}\,(2\pi)^5\,(\pi\, G / c^3\, h)^{1/2} = 0$$

Electron equation

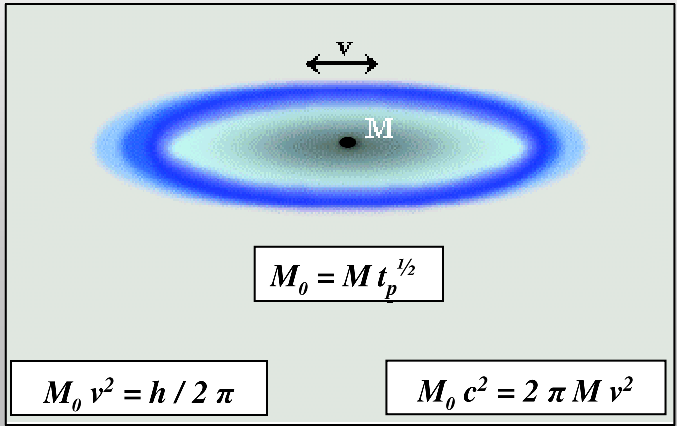
$$\alpha^2 - 2\alpha + (2\pi)^4\,(\pi\, h\, G / c)^{1/2} / e^2\, c^2 = 0$$

Magnetic anomaly

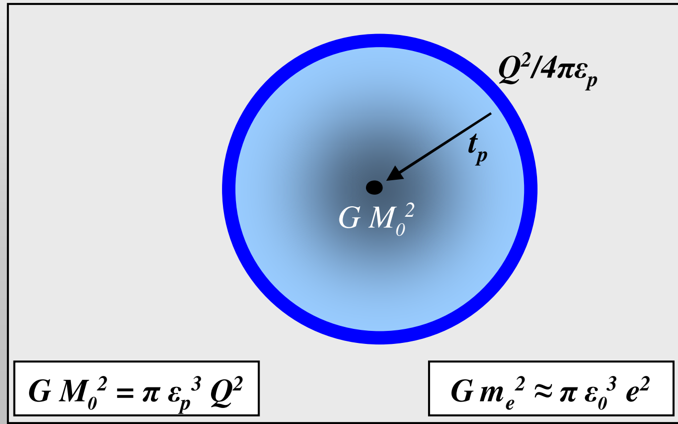
$$(e_0 / e)^{16}\,(1 - \alpha / 2)^{1/8} - 1 = a_e$$

A complete agreement with known values is achieved by lowering the rotational speed from u_0 to u_e. The hypothesis is that the interaction of the electron with the virtual particles present in the vacuum has the effect of lowering its speed.

Planck Permittivity and the Electron Force



Non rotating



Rotating

$$G M_0^2 / G M^2 = 4\pi^2 (v/c)^4 = t_p$$

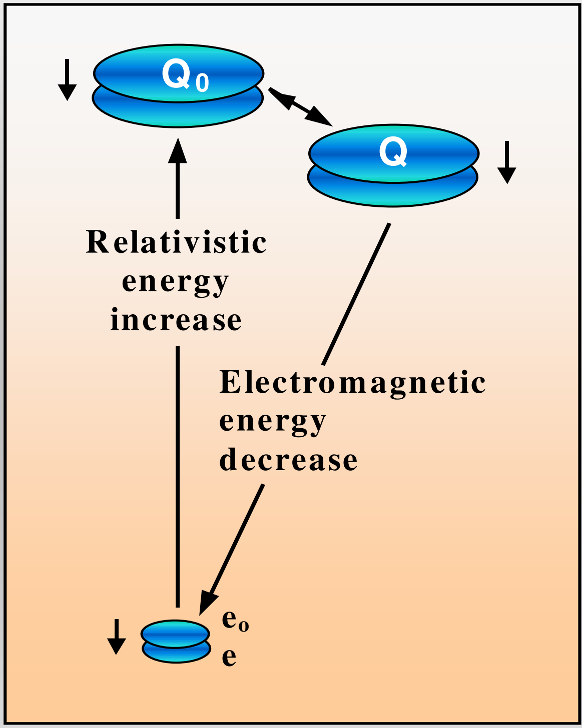
$$v/c = \text{Permittivity } \varepsilon_p$$

$$G m_e^2 = \pi\, \varepsilon_0^3\, e^2\, C$$

$$C = (\alpha / \alpha_0)^{32} (1 - \alpha / 2)^{19/4} \approx 1$$

Mass M would not stand still but would move with speed *v* calculated by applying the uncertainty principle to mass M_0. This would show as the kinetic energy of mass *M*. Their gravitational ratio would contain a constant which is our Planck permittivity. Time t_p and permittivity ε_p are directly related. They would originate a relationship linking the electric and gravitational force in an electron.

Electric and Gravitational Force



$$e = Q / (\alpha / \alpha_0)\ (2 / \alpha - 1)^{1/2}$$

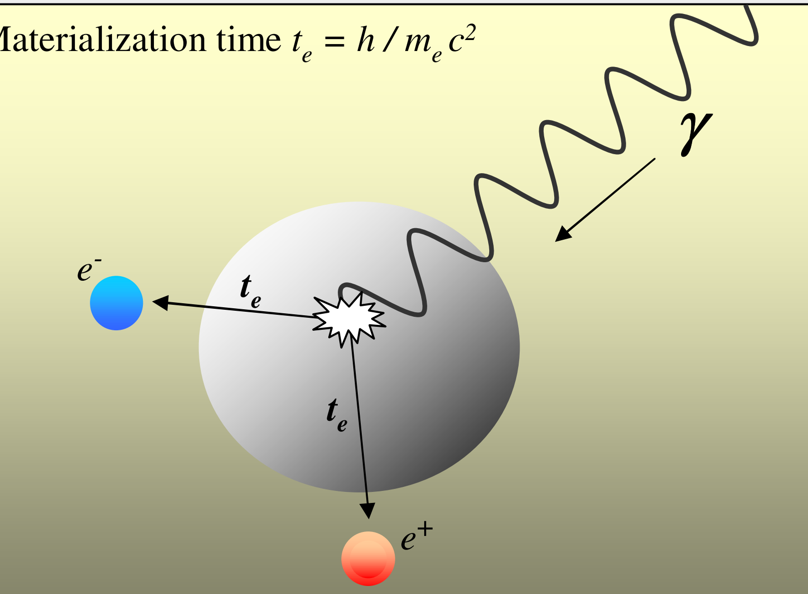
$$\varepsilon_0 = \varepsilon_p / (\alpha / \alpha_0)^2\ (1 - \alpha / 2)$$

$$F_g / F_e = t_p\ (\alpha / \alpha_0)^{24}\ (1 - \alpha / 2)^{3/4} \approx t_p$$

The small change of the rotational speed will lower the charge value. This change is written in terms of the fine structure constant and gives the known permittivity 0.3% higher then the Planck permittivity. the measurable ratio F_g/F_e is now different by 0.2% from t_p.

Electric Field from a Gravity Variation

Materialization time $t_e = h / m_e c^2$



Electric field = $(G\, m_e / t_e) / K_p\ (\alpha/2)^{1/2}\ (1-\alpha/2)^{3/4}\ (\alpha/\alpha_0)^{24}$

$$F_e = e^2 / 4\pi\varepsilon_0 = G M^2 (\alpha / 2)$$

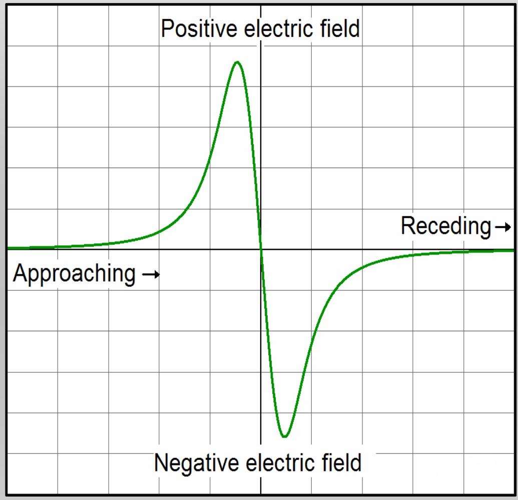
$$K_p = Q / M (\alpha / \alpha_0) (1 - \alpha / 2)^{1/2}$$

$$\Delta g = G\, m_e / t_e$$

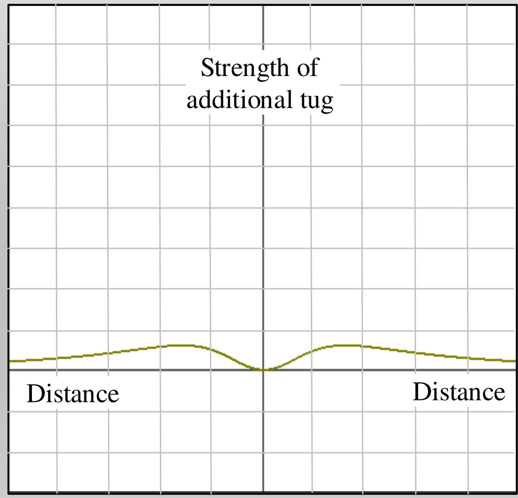
The electron force is equal to the gravitational force of the Planck mass, provided we take in account its rotation represented by *α*. The variation, negative or positive, of mass *M* over an infinite period of time will give us the measurable charge. The same would apply to an electron where the mass variation will generate the relevant electric field.

Deviation from Newton's Law

Electric field from a mass fly-by



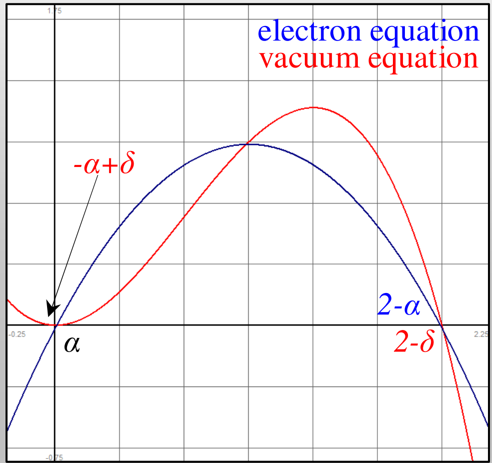
Stronger at intermediate range



Galaxy cluster CL0024+1652

An electric field would be generated whenever one mass moves with respect to another. The attractive force would slightly modify the classic law of gravitation with the peculiarity that it would be prominent only at a certain distance. Could the above galaxy cluster be an example of this additional pull rather then the work of dark matter?

Negative Fine Structure Constant



Fine structure	*negative value*	*standard value*	*strong value*
Planck	*no*	α_0	$2 - \alpha_0$
Electron	*no*	α	$2 - \alpha$
Vacuum	$- \alpha + \delta$	α	$2 - \delta$
Spin speed	$u > c$	$u < c$	$u < c$

$$\delta = 1 + \alpha / 2 - (1 + \alpha - \alpha^2\, 3/4)^{1/2}$$

The vacuum equation will intersect the abscissa in three places: *α, 2-δ* and at a negative point given by *-α+δ*. The negative value hints at the possibility of a speed faster then light by 0.18% but it would not apply to any material particles.

Numerical results within 1 or 2 standard deviations.

All data from *c*, *h* and *G* only.