Re: GRAVITATION

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- *From*: srp <srp2@xxxxxxxxxxxxxxxx>

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kirov a écrit :

> Besides that each formula in the physicist has the physical sense,
> sience of the physicist in engaged in an explanation of physical
> natural phenomena and ignoring of elementary logic resonings conducts
> to disotions of scientific thinking.

You are absolutely right.

This is why logic reasoning has to be made from verified physical natural phenomena.

What do we know for certain about the electron ?

We know for certain that it has an invariant charge

By convention, its value has been set to e=1.602176462E−19 Coulomb, so we can use a precise value in equations.

We also know for certain that it has an invariant mass, that has been very precisely measured to be m = 9.10938188E−31 kg

We also know that this mass amounts to very precisely
E = mc^2 = 8.18710414E−14 Joules

In eV (electron Volts) this amounts to very precisely

E = mc^2/|e| = 510998.9027 eV

(circumstance have made that the absolute value of the electron charge is the same as the conversion factor from Joules to eV)

We know that the proton has a charge identical to that of the electron.

If you apply the Coulomb equation to the rest state of the hydrogen atom, you get

F = ke^2/r^2 = 8.238721759E−8 N

where r is the Bohr radius r= 5.291772083E−11 m
where k = 1/(4 pi eps0) = 8.987551788E9

Which you rightfully approximated to 9E9

where eps0 is the permittivity constant of vacuum

eps0 = 1/(4 pi c^2 10^−7) = 8.854187817E−12

where c is the speed of light c=299792458 m/s

If you resolve eps0 in k you still get

k = c^2 10^−7 = 8.987551787E9

And if you resolve k in the Coulomb equation, you get

F = (e^2 10^−7 c^2)/r^2 = 8.238721759E−8 N

From a paper published by physicist Paul Marmet,

http://www.newtonphysics.on.ca/magnetic/mass.html

The invariant mass of the electron can be defined
from a set of known constants

m=e^2/(2 eps0 alpha lambda_C c^2)

where alpha is the fine structure constant

alpha = 1/137.0359998 = 7.297352533E−3

and lambda_C is the known electron Compton wavelength

lambda_C = 2.426310215E−12 m

If you resolve eps0 in the Marmet definition of the
electron energy, you get

m = (e^2 10^−7 2 pi)/(lambda_C alpha)

If you multiply the Coulomb equation by mutually
reducible occurences of (2 pi)/(lambda_C alpha) you get

F = (e^2 10^−7 2 pi lambda_C alpha c^2)/(lambda_C alpha 2 pi r^2)

or

$F = (e^2 10^{-7} 2 pi)/(lambda_C alpha)$
$*(lambda_C alpha c^2)/(2 pi r^2)$

or, if you resolve for the electron mass from the Marmet paper

$F = m * (lambda_C alpha c^2)/(2 pi r^2)$

Now, we know that the theoretical velocity of the electron in the hydrogen ground state is equal to the procuct of alpha c, so

$v = alpha c = 2187691.252$ m/s

so to obtain that velocity squared in the Coulomb equation, we need to multiply the equation by mutually reducible occurences of alpha

$F = m * (lambda_C alpha^2 c^2)/(2 pi alpha r^2)$

Which you can then reduce to

$F = m * (lambda_C v^2)/(2 pi alpha r^2)$

simple calculation will sho that

$r = lambda_C/(2 pi alpha) = 5.291772084E{-11}$ m

So you can further reduce

$F = m * (r v^2)/r^2 = m v^2/r = 8.238721759E{-8}$ N

Which is

$F = ma = 8.238721759E{-8}$ N

Which shows that the Coulomb equation is in reality the same as the fundamental acceleration equation only expressed differently.

But there is more.

The G constant that you planned to use with the hydrogen atom is defined with parameters belonging to the Solar System, which is immensely larger than the hydrogen atom.

$G = (4 pi^2 r^3)/(M T^2)$

where r is the mean radius of the earth orbit r = 1.4959787E11 m

T is the time for one complete earth orbit

T = 3.15581E7 s (one year)

and M is the estimated mass of the Sun

M = 1.9891E30 kg

which makes

G = (4 pi^2 r^3)/(M T^2) = 6.673E−11

This means that if you want to use G in the hydrogen atom, you have to recalculate G with values that are meaningful to the hydrogen atom, and which are

r = Bohr radius = 5.291772083E−11 m

M = mass of the proton = 1.67262158E−27 kg

and from the frequency of the Bohr ground state energy (f = 6.57968391E15 Hz) you can calculate T

T = 1/frequency = 1.519829851E−16 s

If you recalculate G for the hydrogen atom, you get

G = (4 pi^2 r^3)/(M T^2) = 1.514172983E29

If you use this redefined G in the gravitational equation applied to the hydrogen atom, you get

F = G Mm/r^2 = 8.238721759E−8 N

where M is the mass of the proton,
m is the mass of the electron
and r is the Bohr radius

Which is the same value as the Coulomb equation and the acceleration equation.

Now, if you resolve G in that equation, you get

F = (4 pi^2 r^3)/(M T^2) * Mm/r^2

symplifying, you get

F = m (4 pi^2 r)/T^2

Now, to square the radius you need to multiply
and divide by mutually reducible occurrences of
the radius

F = m (4 pi^2 r^2)/r T^2

But since (2 pi r) is the length of the orbit,
then (2 pi r)/T is the velocity

So, you can resolve for the velocity

F = m v^2/r = 8.238721759E−8 N

or

F = ma = 8.238721759E−8 N

This is why you cannot intermix the Coulomb equation
with the gravitational equation. They simply are
two different representation of the very same
classical acceleration equation F=ma expressed
differently. You can substitute one for the other,
but you cannot intermix them.

For the hydrogen atom,

F = ke^2/r^2 = GMm/r^2 = ma = 8.238721759E−8 N

André Michaud

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