

Quantum Mechanics

solved with

Simplified Orbital Mechanics

Explains observations & solves unsolved problems in QM

An Unlimited Physics publication
by Enos Øye

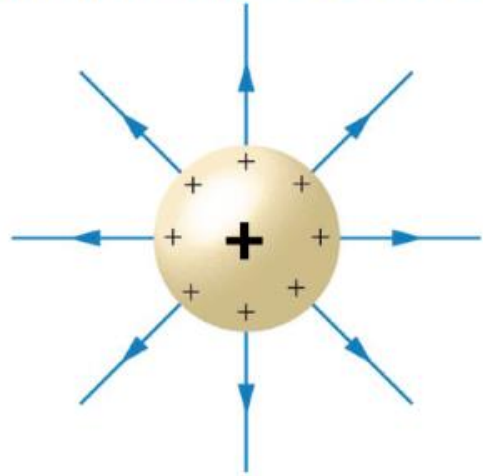


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HOW ELECTROMAGNETIC CHARGES ADD UP

CHARGED OBJECT



Follows Columb's law:

$$F = \frac{kq_1q_2}{r^2}$$

$k = 9 \times 10^9$

and Lorentz law:

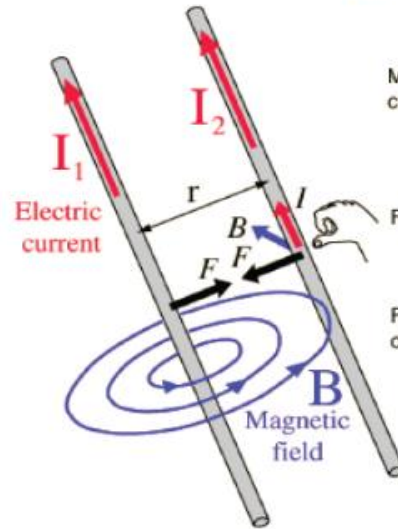
$$\vec{F} = q\vec{E} + q\vec{v} \times \vec{B}$$

Electric force Magnetic force

CURRENT IN A WIRE



Follows Ampere's law:



Magnetic field at wire 2 from current in wire 1:

$$B = \frac{\mu_0 I_1}{2\pi r}$$

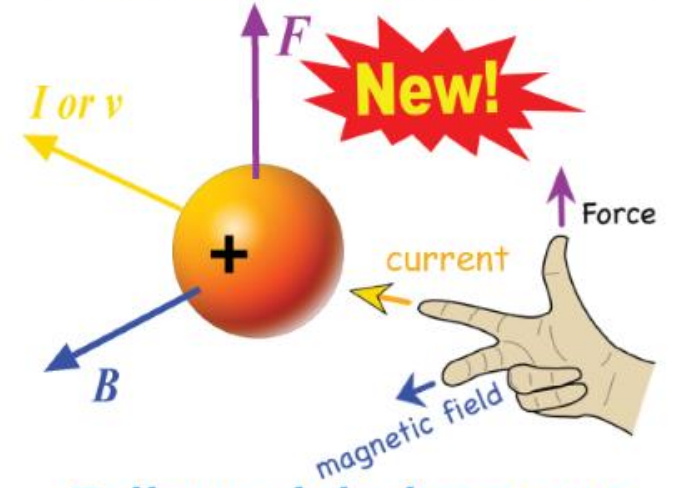
Force on a length ΔL of wire 2:

$$F = I_2 \Delta L B$$

Force per unit length in terms of the currents:

$$\frac{F}{\Delta L} = \frac{\mu_0 I_1 I_2}{2\pi r}$$

ELEMENTAL CHARGE



Follows right hand rule & simplified force:

$$F = \frac{kq_1q_2}{r}$$

$k = 1,7 \times 10^{20}$

and simplified Lorentz law:

$$F = q\vec{E} = q\vec{v} \times \vec{B}$$

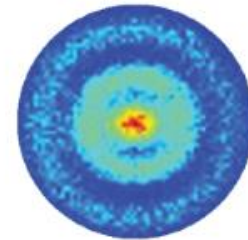
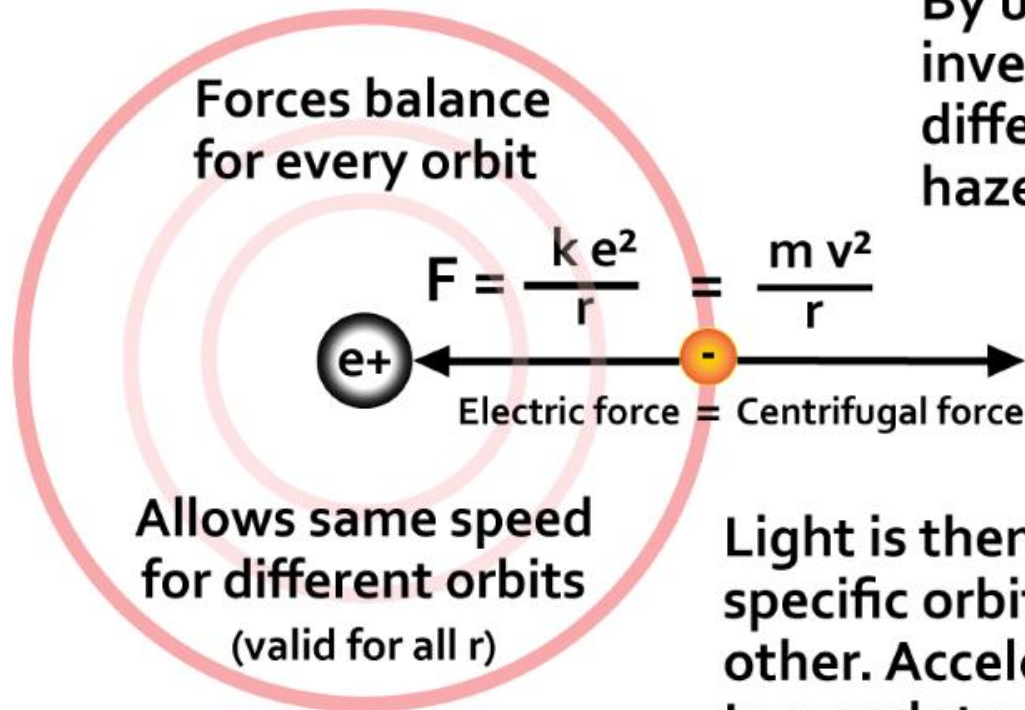
Electric force Magnetic force

New atomic model proposal

Charged particles does not act as charged objects, they follow simplified electrostatic force:

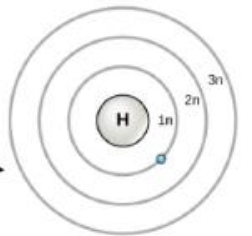
$$F = \frac{k e^2}{r} \quad \text{where } k = \frac{\text{Columb's constant}}{\text{Bohr radius}} = \frac{m v^2}{e^2} = 1,699 \times 10^{20} \text{ [Nm/c}^2\text{]}$$

By using such a force which follows inverse law, and not inverse square law, electrons may have the same speed in different orbits, this explains why we observe an electron haze and not Bohr's electron shells.



Explains why we observe this

and not this:



Light is then not emitted by electrons quantumly jumping between specific orbits, but electrons going from one quantized speed to another. Acceleration emits light and deceleration absorbs light. In a cyclotron charged accelerating particles also emits light.

$$E_p = \frac{m v^2 e^2}{e^2 n^2} = \frac{m v^2}{n^2}$$

$$E_K = \frac{m v^2}{2n^2}$$

$$E_{\text{tot}} = \frac{-m v^2}{2n^2}$$

$$\Delta E = \frac{m}{2} \left(\frac{v^2}{n_1^2} - \frac{v^2}{n_2^2} \right) = \frac{h c}{\lambda}$$

e = charge = $1,6 \cdot 10^{-19}$ C

m = electron mass = $9,1 \cdot 10^{-31}$ kg

v = 2188045 m/s

h = $6,626 \cdot 10^{-34}$ Js

c = 299792458 m/s

New postulates for the atom!

More than
100 years after Bohr!

Postulate 1: An electron revolve around the nucleus in an electron cloud

Well that is easy to say as that is what we observe, but how can the electron move inward and outwards from the nucleus while maintaining the same speed? It is rather simple we just take the electrostatic force and multiply it with the Bohr radius:

$$F = \frac{k_c e^2 \times \text{Bohr radius}}{r^2} = \frac{k e^2}{r} = \frac{mv^2}{r}$$

New constant is $k = mv^2/e^2 = k_{\text{columb}}/\text{Bohr } r = 1,699 \times 10^{20} \text{ [Nm/c}^2\text{]}$
(r can now change while the forces are equal to each other)

Postulate 2: When an electron accelerate from a lower to a higher quantized velocity it emits a photon

$$\Delta E_k = \frac{m v^2}{2} \left(\frac{1}{n^2} - \frac{1}{n'^2} \right) = \frac{k e^2}{2} \left(\frac{1}{n^2} - \frac{1}{n'^2} \right) = \frac{h c}{\lambda} \quad (\text{energy no longer tied to radius})$$

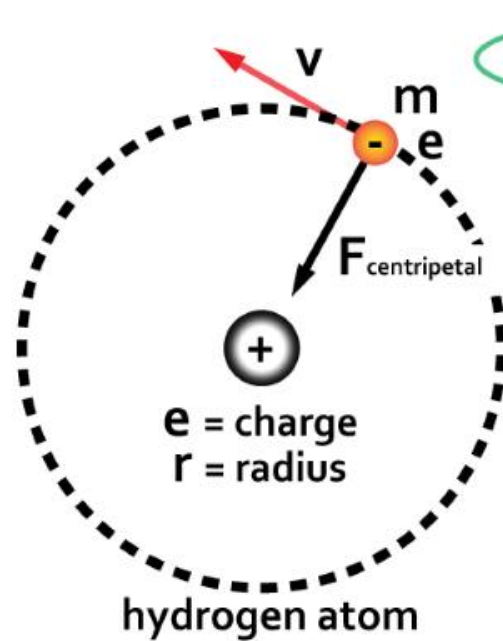
This equation give all light series correctly for the hydrogen atom, and experiments already show that accelerating electrons emits light.

Postulate 3: The simplified electrostatic force can be set equal to the magnetic force

$$F = \frac{k e^2}{r} = \frac{mv^2}{r} = e v B \quad (\text{magnetic field can now be easily calculated})$$

At the quantum level the magnetic force and the electrostatic force is expressions of the same electromagnetic force, and this is a simplification of Lorentz law. It is then equally correct to say that the electron is bent into orbit by the magnetic field, as saying the electric force holds the electron in orbit.

Testing simplified electromagnetic force



Simplified electric force

$$F_{\text{centripetal}} = \frac{m v^2}{r} = \frac{k e^2}{r} = e v B \text{ [Newton]}$$

magnetic force

Where: constant is: $k = m v^2 / e^2 = 1,699 \times 10^{20} \text{ [Nm/c}^2\text{]}$
 electron mass: $m = 9,1 \times 10^{-31} \text{ [kg]}$
 electron speed: $v = 2188045 \text{ [m/s]}$
 Bohr radius: $r = 5,29 \times 10^{-11} \text{ [m]}$
 electron charge: $e = 1,6 \times 10^{-19} \text{ [C]}$

Solving for magnetic field: $B = \frac{k e^2}{r e v} = \frac{k e}{r v} = 235104 \text{ [Tesla]}$

Solving for constant: $k = B r v / e = 1,699 \times 10^{20} \text{ [Nm/c}^2\text{]}$

Solving for electron mass: $m = k e^2 / v^2 = 9,1 \times 10^{-31} \text{ [kg]}$

Solving for electron speed: $v = k e / B r = 2188045 \text{ [m/s]}$

Solving for Bohr radius: $r = k e / B v = 5,29 \times 10^{-11} \text{ [m]}$

Solving for electron charge: $e = B r v / k = 1,6 \times 10^{-19} \text{ [C]}$

The formulas are correct as we get all the table values!

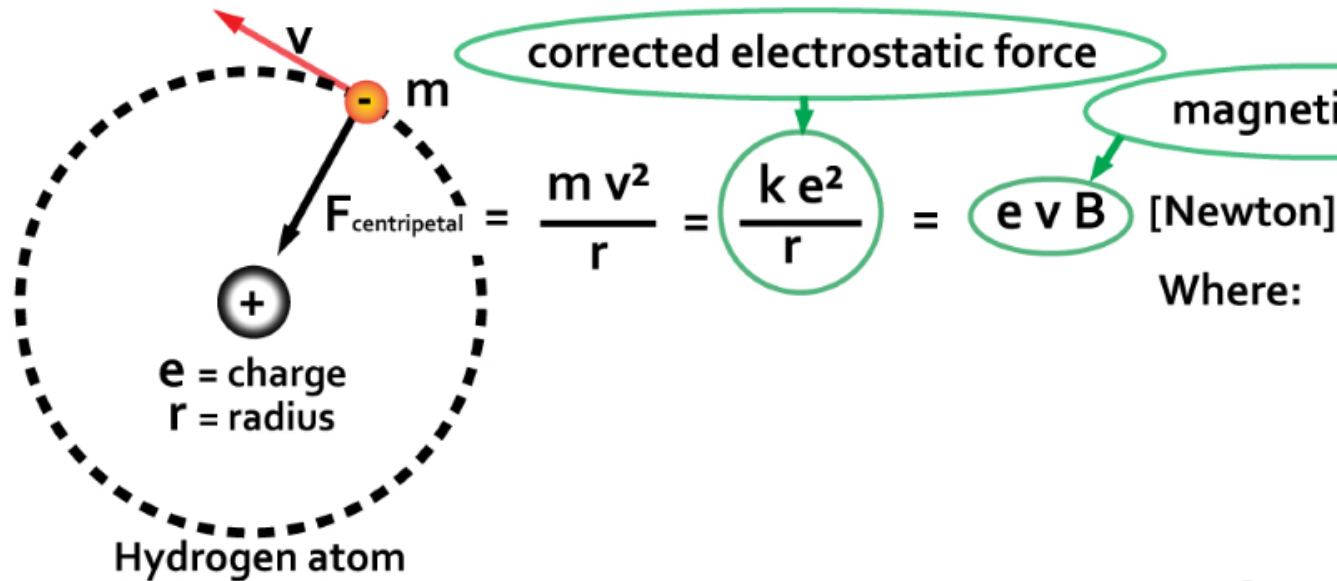
The formulas also give 100% correct units.

MATHEMATICALLY PROVEN!

Bohr magneton simply calculated

The Bohr magneton is a constant expressing the magnetic moment of an electron in its lowest energy state in the hydrogen atom.

Currently the Bohr model is used to find the Bohr magneton, and it uses quantized angular momentum and complex calculation. Simplified orbital mechanics give a much simpler way to calculate the Bohr magneton:



Where:

- constant: $k = mv^2/e^2 = 1,699 \times 10^{20}$ [Nm/c²]
- electron mass: $m = 9,1 \times 10^{-31}$ [kg]
- electron speed: $v = 2188045$ [m/s]
- Bohr radius: $r = 5,29 \times 10^{-11}$ [m]
- electron charge: $e = 1,6 \times 10^{-19}$ [C]

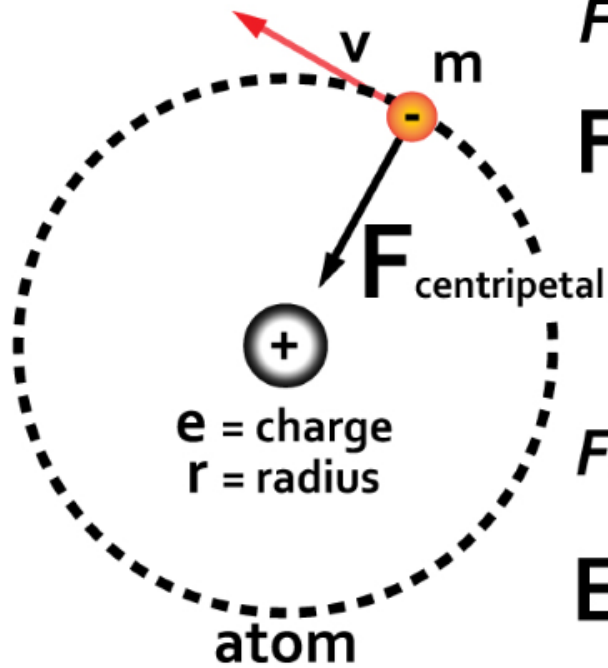
Solving for kinetic energy: $E_K = \frac{mv^2}{2} = \frac{k e^2}{2} = 2,18 \times 10^{-18}$ [Joule]

Solving for magnetic field: $B = \frac{k e^2}{r e v} = \frac{k e}{r v} = 235104$ [Tesla]



Bohr magneton = $E_K/B = e v r/2 = \frac{2,18 \times 10^{-18}}{235104} = \underline{\underline{9,274 \times 10^{-24}}}$ [J/T] New simple calculation!

Emitting light!



Force can be expressed in several ways:

$$F = \text{Centripetal force} = \frac{m v^2}{r} = \text{Electric force} = \frac{k e^2}{r} = \text{Magnetic force} = evB = \text{Light force} = \frac{2hc}{\lambda r}$$

Force gives these equal expressions of Energy:

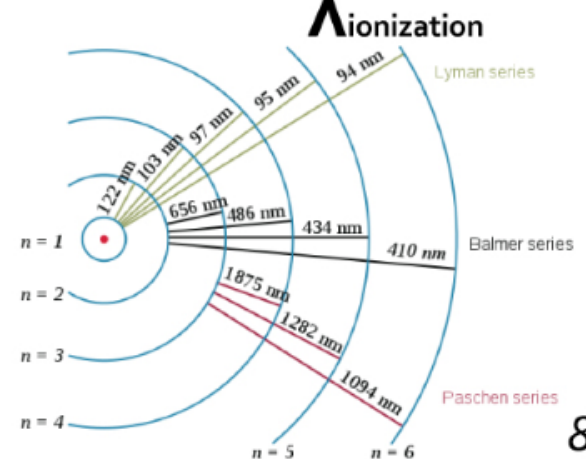
$$E = \text{Kinetic energy} = \frac{m v^2}{2} = \text{Electric energy} = \frac{k e^2}{2} = \text{Magnetic energy} = \frac{evBr}{2} = \text{Light energy} = \frac{hc}{\lambda_{\text{ionization}}}$$

Light is emitted or absorbed as quantum energy level change:

$$\Delta E = E \left(\frac{1}{n^2} - \frac{1}{n'^2} \right) = \frac{hc}{\lambda} \quad , \quad \lambda = \frac{hc}{\Delta E} \Rightarrow$$

($n=1,2,3,4,5,6$)

Give all light series for the hydrogen atom !



The fine structure constant is found!

$$\alpha = \frac{2 \times \text{electron wavelength}}{\text{photon wavelength}} = 0,0072974 \qquad \alpha^{-1} = \frac{\lambda_p}{2\lambda_e} = 137,0345$$

It describes the matter wave - light wave - matter wave interaction
The observer and the observed is in vibrational coherence!

The solution:

$$\alpha = \frac{k_c e^2}{\hbar c} \stackrel{\substack{\text{Setting free} \\ \text{Planck unit} \\ \hbar = h/2\pi}}{=} \frac{2\pi k_c e^2}{hc} \stackrel{\substack{\text{Setting free} \\ \text{simplified} \\ \text{constant} \\ k_c = r_B k}}{=} \frac{2\pi r_B k e^2}{hc} \stackrel{\substack{\text{Rewriting} \\ hc = E \lambda}}{=} \frac{2\pi r k e^2}{E \lambda} \stackrel{\substack{\text{Noticing the} \\ \text{simplified} \\ \text{kinetic energy} \\ ke^2 = 2E}}{=} \frac{2\pi r 2E}{E \lambda} \stackrel{\substack{E/E \text{ cancels} \\ \text{out}}}{=} \frac{2\pi r 2}{\lambda} \stackrel{\substack{\text{Circumference is} \\ \text{wavelength} \\ 2\pi r = \lambda}}{=} \frac{2\lambda_e}{\lambda_p} \quad [\text{units cancel out}]$$

Constant calculation from Hydrogen data:

$$\alpha = \frac{2\lambda_e}{\lambda_p} = \frac{2\pi r 2}{\lambda} = \frac{4\pi \text{ Bohr radius}}{\text{ionization wavelength}} = \frac{4\pi \cdot 5,29 \times 10^{-11}}{9,11009 \times 10^{-8}} = 0,00729$$

We only used the new energy formula:

$$E = \frac{k e^2}{2} = \frac{hc}{\lambda} \quad , \quad k = \frac{\text{Columbs constant } k_c}{\text{Bohr radius}}$$

The secrets of the universe

Enos Øye

Centripetal force = Simplified Electric force = Magnetic force = Light force

$$F = \frac{mv^2}{r} = \frac{ke^2}{r} = evB = \frac{2hc}{\lambda r}$$

$$\Delta E = E \left(\frac{1}{n^2} - \frac{1}{n^2} \right) = \frac{hc}{\lambda} = hf = pc$$

$$\Delta E_R = (\gamma_n - \gamma_n)mc^2$$

It is equally correct to say that the magnetic field bends the charged particle into orbit, as saying the electric force holds the charged particle in orbit.

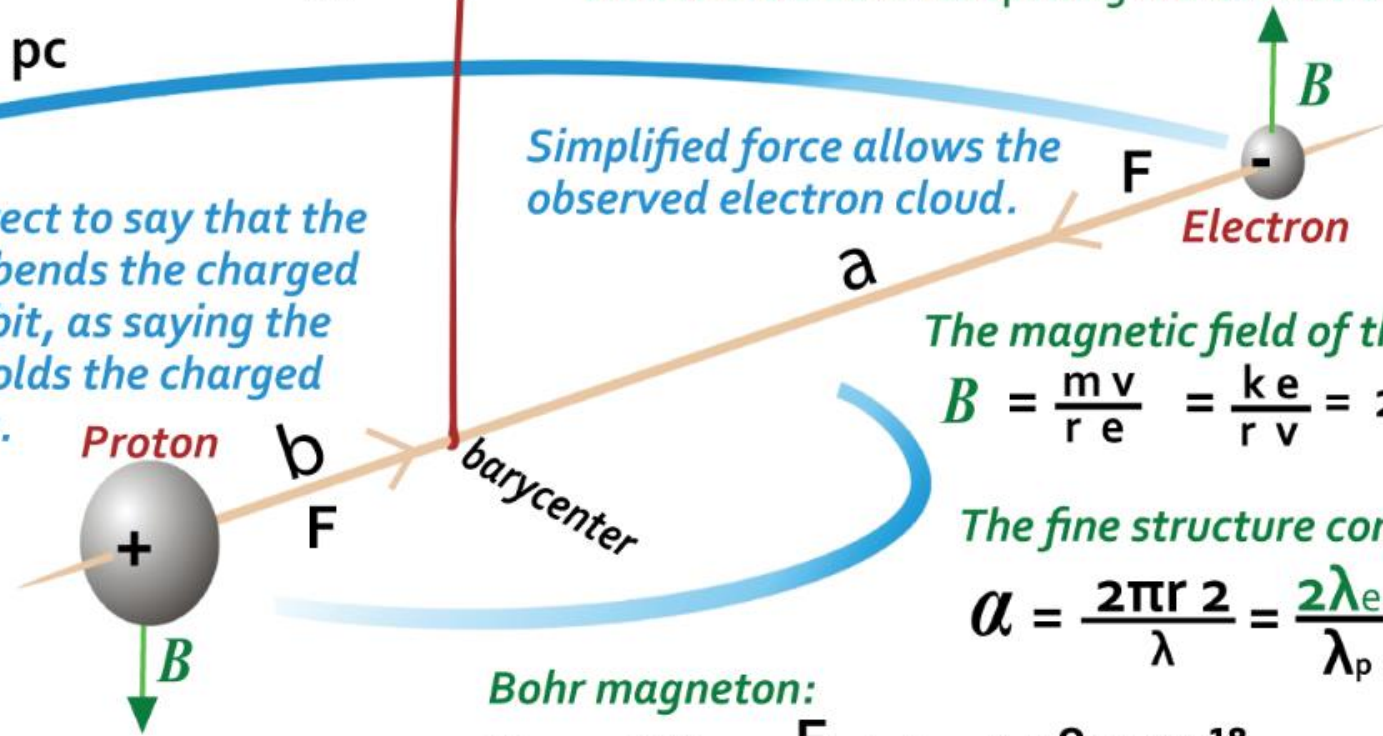
Fine structure: $\frac{b}{a} = \frac{\text{mass electron}}{\text{mass nucleus}}$

Hydrogen = 0,000544624

Deuterium = 0,000272125

Electron has two energies, one ordinary and one relativistic, this cause the observed splitting in the fine structure of light.

Simplified force allows the observed electron cloud.



The magnetic field of the electron is:

$$B = \frac{mv}{re} = \frac{ke}{rv} = 235\ 085 \text{ Tesla}$$

The fine structure constant:

$$\alpha = \frac{2\pi r^2}{\lambda} = \frac{2\lambda_e}{\lambda_p} = 0,00729$$

Bohr magneton:

$$\mu_B = \frac{evr}{2} = \frac{E_{\text{ionization}}}{B_{\text{electron}}} = \frac{2,18 \times 10^{-18}}{235\ 085} = 2,74 \times 10^{-24}$$

$k = \frac{\text{Columb's } k}{\text{Bohr radius}}$

The magnetic field of the proton is:

$$B = \frac{mv}{re} = \frac{ke}{rv} = 430\ 975\ 598 \text{ Tesla!}$$

“If you want to find the secrets of the universe, think in terms of energy, frequency and vibration”

Nikola Tesla