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Cooper pair distance

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See Unified Absolute Relativity Theory at:

www.wbabin.net/saraiva/saraiva305.pdf
www.wbabin.net/saraiva/saraiva306.pdf
www.wbabin.net/saraiva/saraiva307.pdf
www.wbabin.net/saraiva/saraiva328.pdf

$$d^2 = \frac{x^4 \alpha}{2\pi . S} \; ; \qquad S = \frac{{\varepsilon_0}^2 \alpha^4}{12\pi^4}$$

For the electron:

$$d = 1.44 \times 10^{-8} m \; ; \qquad x_e = 2.426 \times 10^{-12} m$$

For the proton:

$$d = 4.3 \times 10^{-15} m \; ; \qquad x_P = 1.321 \times 10^{-15} m$$

$$d = \frac{n^2 x_P}{\pi} \qquad \Leftrightarrow \qquad n = 3.2$$

1/3.2 = Proton fine structure constant

$$n^2 = x\sqrt{\frac{\pi\alpha}{2S}}$$

Cooper pair force:

$$F = \frac{{q_e}^2 {\varepsilon_0} \alpha^3}{24\pi^4 x^4} = \frac{hSf^4}{w^3}$$

Electron:

$$F = 1.1 \times 10^{-12} N$$

Proton:

$$F = 12.4 N$$

x - Compton wavelength; α - Fine structure constant;

ε_0 - Vacuum permittivity; q_e - Electron charge.

Force with distance:

$$F = \frac{F_{CP} d^2}{D^2}$$

F_{CP} - Cooper pair force; d – Cooper pair distance; D – Distance.

Cooper pair energy:

Proton - $$E = \frac{{q_e}^2}{4\pi\varepsilon_0 4.3\times10^{-15}} = 0.335MeV$$

Electron - $$E = \frac{{q_e}^2}{4\pi\varepsilon_0 1.44\times10^{-8}} = 0.1eV$$

Electron rest energy:

$$\frac{q_e q_m c}{\pi R_e} = 0.511MeV\ ; \qquad R_e = \frac{x_e}{2\pi}$$

q_m - Magnetic charge; $q_m = \frac{h}{2q_e}$

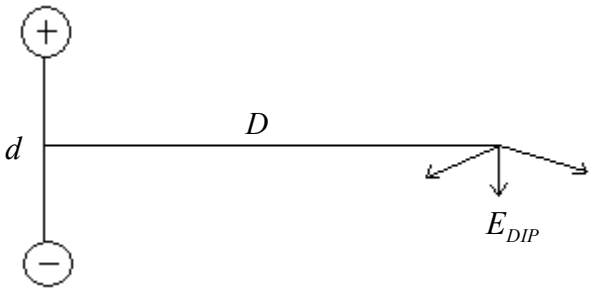
The gravitational potential is a squared orbital speed and is an electric field:

General formula:

$$v^2 = E = \frac{6q_e dn}{10\pi\varepsilon_0 {R_T}^2 D} = \frac{Gq_e k_B n}{dD} = \frac{GM}{D}$$

$R_T = 6.371\times10^6 m$ - Earth radius; v – Orbital speed; $d = x_P$ - Proton wavelength;
E – Electric field of a neutral dipole; G – Gravitational constant;
n – Number of quantuns of mass; k_B - Boltzmann constant;

Electric field of a neutral dipole:



$$E = \frac{q_e}{4\pi\varepsilon_0 D^2}$$

$$E_{DIP} = \frac{Ed}{\sqrt{2}D} \qquad \Leftrightarrow \qquad E_{DIP} = \frac{q_e d}{4\sqrt{2}\pi\varepsilon_0 D^3}$$

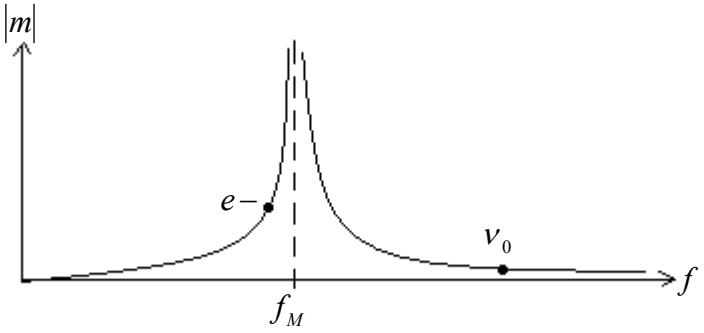
$$E_{DIP} = \frac{q_e d}{4\sqrt{2}\pi\varepsilon_0 R_T{}^2 D}$$

Force in a superconductor and between a superfluid:

$$F = \frac{hSf_0{}^4(c^2 - v^2)^2}{c^2(c^2 - vw_0)(w_0 - v)^3}$$

v = c $\Leftrightarrow$ F = 0 ; $w_0 \approx c$

Relation electron-neutrino:



Mass of the particles and waves:

$$m = \frac{hf}{c^2 - Sf^2}$$

Neutrino mass:

$$\frac{m_e}{m_\nu} = \frac{1}{2\pi\alpha^3} \qquad \Leftrightarrow \qquad m_\nu = 2.2\times10^{-36}\,kg$$

Neutrino wave speed:

$$w = \frac{cx_e}{2\pi\sqrt{S}\alpha^3} = 2.16\times10^{19}\,m/s$$

Neutrino frequency:

$$\frac{f_\nu}{f_e} = \frac{x_e^{\,2}}{2\pi S\alpha^3} \qquad \Leftrightarrow \qquad f_\nu = 1.57\times10^{36}\,Hz$$

$m_e; f_e, x_e$ -- Electron mass, frequency and wavelength.

Neutral particle of a visible photon:

$$f = 5\times10^{14}\,Hz \qquad \Leftrightarrow \qquad f_0 = 3.87\times10^{41}\,Hz$$

Important numbers of the electron:

$$3.05 = cx_e\sqrt{\frac{\varepsilon_0}{\pi.q_e}}$$

$$2.962 = \frac{3.05^2}{\pi}$$