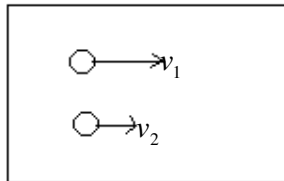


Difference: Particle-Wave

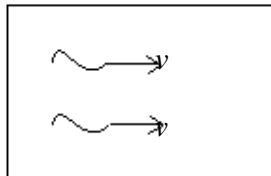
António Saraiva – 2009-08-08
ajps2@hotmail.com

See Unified Absolute Relativity Theory at:

<http://www.wbabin.net/saraiva/saraiva105.pdf>
<http://www.wbabin.net/saraiva/saraiva223.pdf>



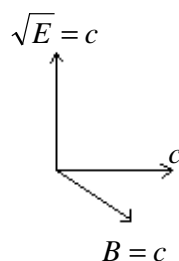
For particles: equal particles in a medium can have different speeds. The propagation speed of a particle is variable.



For waves: equal waves in a medium have always the same speed. The propagation speed is constant.

The electron and the neutrino are particles, not waves.
The photon is a wave, not a particle.

Total speed of a photon of low frequency



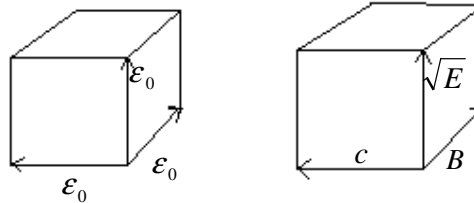
$$V_T = \sqrt{3}c \quad ; \quad \alpha = \text{Artg} \frac{1}{\sqrt{2}} = 0.61548 \text{rad}$$

Total energy of the vacuum quantum:

$$E_T = 3 \left(\frac{\epsilon_0}{\mu_0} \right)^2 \quad ; \quad E_T = 929.531 \text{MeV}$$

Energy of a proton: $E = 938.246 \text{MeV}$

The vacuum



The propagation speed, the magnetic field and the square root of the electric field are all speeds.

The vacuum is quantized in distance – the permittivity vector, and is quantized in speed – light speed.

What is moving? Is moving the quantum of the vacuum:

$$E_0 = \left(\frac{\epsilon_0}{\mu_0} \right)^2 = 310 \text{MeV}$$

Volume: $V_0 = \epsilon_0^3 \quad ; \quad E_0 = \epsilon_0^4 c^4$

Density: $\rho_{E0} = \epsilon_0 c^4 = 4.46 \times 10^{41} \text{eVm}^{-3}$

Universe volume:

$$V_U = \frac{4}{3} \pi R_U^3 = 9.2 \times 10^{78} \text{m}^3$$

Total energy of the universe vacuum:

$$E_U = V_U \rho_{E0} = 3.6 \times 10^{120} \text{eV}$$

Variation of the electric charge with speed

$$q = \frac{q_0}{1 - v^2/c^2}$$

$$q = q_0 c^2 \frac{c^2 - v^2}{(c^2 - v^2)^2 + a}$$

For the electron:

$$w = c - \Delta w ; \quad \Delta w = \frac{Sf^2}{2c} = 4.875 \times 10^{-3}$$

$$q_e = q_e c^2 \frac{2c\Delta w}{(2c\Delta w)^2 + a} \quad \Leftrightarrow$$

$$\Leftrightarrow \quad a = 2.627 \times 10^{23}$$

Maximum:

$$q_{MX} = \pm 209.4 q_e$$

