

The question is what impact of this *entity* $\Psi_{1/2}$ as magnitude $|\Psi_{1/2}|$ of information behaviour can be perceived in an external measurement? Our best guess is the speed of information relative to the frequency energy of the internal oscillations. And the best guess of this could be to measure the rest mass of one *entity* $\Psi_{1/2}$. Then we have an estimate of the external extension magnitude as (6.524)

$$(6.538) \quad r_{1/2} = \frac{c}{\omega_{1/2}} \sim \frac{2\hbar c}{mc^2} \sim \frac{2\hbar}{mc}.$$

We conclude, the higher the oscillating-frequency-energy mass of one *entity* $\Psi_{1/2}$ the smaller is the space extensive magnitude $|\Psi_{1/2}|$ of this indivisible *quantum* of one fermion $\Psi_{1/2}$.

This is just the opposite of what we suggest or propose for macroscopic bodies $r_M \propto \sqrt[3]{M}$ composed of myriads of fermions.

For fermions, we will try to avoid the ultraviolet catastrophe⁴⁰¹ as point particles $0 < r_{1/2} < \infty$ and the infinite transverse extension, e.g. eternal information development of neutrinos as massless infinity extension.

6.8.1.2. The Rest Mass Problem of Fermions

We will not in this volume go into an analyses of the *mass* concept.⁴⁰²

We will only declare a synthetic judgment:

The *mass* concept is a *secondary quality* that emerged from the *primary quality* of space structure and development.

And we contradict the Newtonian inference of infinite speed of mass information eternally.

– We now stop hold the analyses of the internal local structure of 3-space.

⁴⁰¹ The radius zero for a point particle implies an infinite mass located at that point. The oscillating entity will possess infinite energy.

⁴⁰² A hint could come from the idea of a plane circular harmonic quantum oscillator as described in §I. 3.3.4.2 by the first excitation formula I. (3.169) $E_{\omega,1} = 2\hbar\omega = (\hbar\omega + \hbar\omega) = {}^1E_{\omega} + E_{\omega,0} = T_{\omega} + V_{\omega}$. Where the portable energy is $L_{\omega} = T_{\omega} - V_{\omega} = 0$ for the free oscillating subton. Due to the locality of fermions of independent planes of oscillators with interconnected angular momenta the locality potentials of $V_{\omega_{1/2}}$ may no longer balance the kinematic energies $T_{\omega_{1/2}}$ of the oscillations internal in the fermion.

6.9. External Relations Between Fermions in an Extended Space of Information

Now the goal is to analyse the external interaction and relation between fermions and all other possible entities that possess locality in full geometric space concept \mathfrak{G} described in section 4.2. The topological structure has classically been described by solids, whereas the Platonic idea of the regular tetrahedron was the simplest geometrical solid figure that extensively spans stereo space. A space we here in this book have called 3-space. The spherical symmetry has then been the circumscription of the tetrahedron idea. The classical idea was that natural space is extensively spanned by some extended *entities*, which have spherical symmetric with incompressible exclusive repulsion forming a fluid space. Maxwell developed his electromagnetic equations on a fluid model of this. This fluid idea inferences the ether idea, which later was dismissed, and the idea of vacuum space was possible. To facilitate all this a spiritual mathematical model of a linear vector space $V_3(\mathbb{R})$ representing the Descartes extensions between solid *entities* such as fermions was religiously promoted to the mathematic master instance (GOD) giving the space where nature we experience exists. This I immediately must judge as an illusion.

What in reality give us the perception of space around us is our reception of light carrying hesitating information in a development with a finite speed. All relation between physical *entities* is *imperative* depending on the hesitating transmission-development of information.

The visual space is spanned by the propagation of light photons (subtons) and the emergence of extension is emancipated in our thinking minds.

In a “GOD’s eyes” view external to whole this visual universal space (as we humans are inclined to) it seems there is a problem of hesitating information interaction spatial delayed back and forth (as vice versa).

But here we have forgotten, that the *carrier clock* $\{t_c\}$ of subtons (3.259) always is in a now state $t_c = \tau = 0$ of its own *null line* of its propagation path. The *FORWARD* information subton and the answering subton have the same own clock timing *null*. Look in section 5.7 to interpret this. This point of view is staggering, that when you receive light from the Andromeda Galaxy the clock of the subtons is in a now-state, and when you take a mirror and reflect these subtons back to Andromeda, the subton clock is just the same $t_c = \tau = 0$ back to its start, and there delayed if measured relative to its start.

But this is just the essence of the *null line* concept displayed in Figure 5.53.

This principle is well understood in the concept of a LASER where the resonance between the two mirrors just gives the same clock phase of all the photons in the *null line* of the standing wave. A help to accept this is to remember, that the clock phase moves with the speed of information in any laboratory frame of an observer, while it oscillates circular transversal at each locality in the lab between the mirrors. The classical concept of time stands still internally inside the laser wave. (This is antagonistic to eternity where all times are available simultaneously, “as GOD’s time”)

6.9.1. A New Break Through for Physics Foundation in Human Knowledge of Nature

When we physicists tries to use mathematic tools and results, we often have to go back to the natural foundation of mathematics and build it step by step so that each step has an understandable physical foundation in nature. The first time I found this don seriously systematic was when I 2011 found the concept of Geometric Algebra on Wikipedia in a search for knowledge about quaternions. It led me to David Hestenes’s Oersted Medal Lecture 2002 [5], etc. Then I was captured by his methodical ideas, which I interpret as follows:

First, take drawn line segments with arrows intuit as icons seen as *objects* representing underlying *subjects* in a *quality* of a *substance* in Nature. Then represent these icons with the symbols **a**, **b** which we endowed with real numbers for their magnitudes⁴⁰³ $a = |\mathbf{a}|$, $b = |\mathbf{b}| \in \mathbb{R}$.

⁴⁰³ just as Descartes did for line segments, see for example [10] p5-9.