7. The period of pulsation of the elementary charges

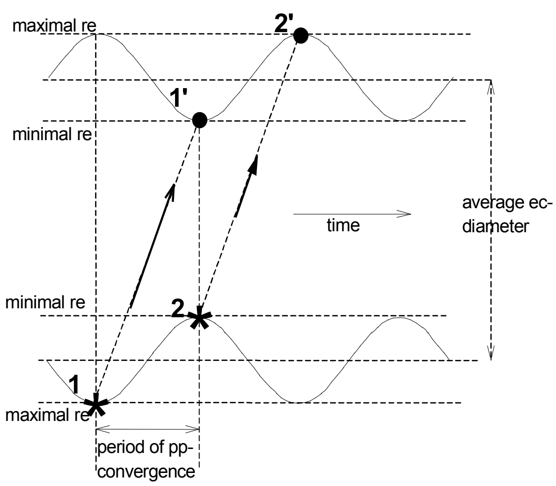
In the energon hypothesis the mass and charge of the *ec*'s are not considered to be constant. This vision has already been mentioned in the Introduction, § 2.3 and § 3.5.4. It seems to be reasonable to suppose that the two opposite sides of the *ec*-mantle are connected by the period of *pp*-convergence (Δt_{re}) in such a way, that the opposite stages of *ec*-pulsation will be connected too. This means that the period of *ec*-pulsation and the period of *pp*-convergence can be described by $t_{pe} \approx 2.\Delta t_{re}$.
In this way the *ec*-pulsation may be regulated.
According to this consideration, the value of t_{pe} must be:

$$t_{pe} = \frac{4.r_e.\sqrt{2}}{c} = \frac{4\sqrt{2}\,\mathrm{x}\,6.6979\mathrm{x}10^{-18}}{2.997925\mathrm{x}10^{8}} = 1.2638\mathrm{x}10^{-25}\,s,$$ or rounded of

t_{pe} = 1.26 × 10^{-25} s, with the frequency: **υ_e = 7.94 × 10^{24} s^{-1}** (= $1/t_{pe}$).

With spheres the ratio between the area and the capacity is larger if the diameter is smaller, as reproduced by $4\pi r_e^2/(4/3)\pi r_e^3 = 3/r_e$. But a smaller *ec* must have a higher *Spp*-density at its surface. Probably a higher *Spp*-density will cause a lower *pp*-emission, see § 9.8.2. That density must be proportional to the square of the *ec*-radius.

Figure 47



Pulsating mechanism of ec's, fig.47.

1: lower density, higher emission;
1': stronger force causing expansion;
2: higher density, lower emission;
2': too low force to prevent contraction

If the period of *ec*-pulsation (t_{pe}) is two times the period of *pp*-convergence of an *ec* (Δt_{re}), *the inside working forces stabilise the ec and enable its existence.*

7.1. The variation of radius, charge and mass of an elementary charge

The pulsation of *ec*'s will have some consequences with respect to the overall spread of *pp*-velocities, because the pulsation may be seen as a movement of the *ec*-surface with respect to the *ec*-centre.
Though the *pp*-spread with respect to the *ec*-surface is *c ± V*, the effective spread with respect to the *ec*-centre is *c ± V ± vg*. The velocity *vg* indicates the maximum velocity (positive or negative) of the *ec*-surface.
This effective *pp*-spread has been derived in § 2.3, namely *c ± ½c ± 0.0176 c*, which means that the average velocity of the *ec*-surface during $t_{pe}/2$ must be:

$$v_{gm} = \pm 2/\pi \times 0.0176c = \pm 0.0112c,$$

because the velocity of the surface is a sine-function of time.
This average velocity is working during one half of t_{pe} (= 0.5 × 1.26 × 10^{-25} s), thus the covered distance in that period measures:

$$\Delta r_e = 0.5 \times 1.26 \times 10^{-25} \times 0.0112c = 2.11533 \times 10^{-19} \text{ m} = 0.03158\ r_e.$$

Therefore the values of r_e can be described by the equation:

$$\mathbf{r_e^{\pm} = r_e.(1 + 0.03158.\sin\phi)}, \text{ if } \phi = 0^0 \rightarrow 360^0 .$$

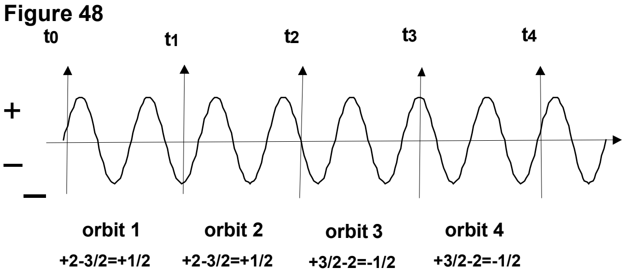
The charge and mass of the *ec* are coupled with the *Spp*-density of the mantle, thus with the *ec*-area, and because $r_e^2 \propto (1 + 0.03158.\sin\phi)^2 = (1 + 0.064.\sin\phi)$ one can say: $\mathbf{m_e \propto e \propto r_e^2}$ or $\mathbf{m_e^{\pm} = m_e.(1 + 0.064.\sin\phi)}$ and $\mathbf{e^{\pm} = e.(1 + 0.064.\sin\phi)}$.

7.2 The derivation of whole-numbered ratio's in rotating *ec*-systems.

For a better understanding of the ratio between the orbiting period of a poël (stable electron/positron system) on one hand, and the period of *ec*-pulsation or the period of *pp*-convergence on the other hand, it is necessary to pay attention to the mass of *ec*'s, as defined in the energon hypothesis. The hypothesis states that the mass of an *ec* depends on the *pp*-activity of the *ec*-surface, in relation to the field of *pp*'s from elsewhere. To the inner *ec*, mass cannot be imputed. A high active phase of the interacting *ec*'s must be accompanied by a larger mass and sensitivity.
This insight must lead to three theses:
a/ The mass transport happens according to a wave-like function.
b/ The ec's in opposite position must be in equal phase in order to be able to exert equal forces at the same moment in each rotation (see § 3.5.4).

c/ The overall transport of mass has to be in accordance to the classic rules of mass transport in orbiting systems.

Figure 48



The three statements are leading to the conclusion that each half of the orbit must contain a whole number of waves.

This may be understood looking at **figure 48.**

In this figure the course of the *ec*-pulsation during a series of orbits is pictured. One can see that the displacement of waves along the track during succeeding orbits would entail an unbalanced displacement of mass, contradictory to classic mechanics (c/). Because of (b/), each half of the orbit will contain a whole number of waves.

The relation $t_{pe}/\Delta t_{vm}$ in a poël can be understood, if one is aware of the fact that, within the period Δt, one *ec* communicates with several other situations of the second *ec*. The same arguments can be advanced, as done with the whole orbit: a displacement of mass over the Δt-period should be well-balanced, in order to get a smooth interaction. This means that the Δt_{vm}-period must contain a whole number of t_{pe}-periods. As has been shown in paragraph 3.5.5, a poël behaves according to the above principles.

Though the interactions between a proton and the orbiting electron in a *H* -atom are much more complicated (certainly with nuclei and orbiting *ec*-clouds), yet equal arguments may be advanced to explain the whole-numbered *ec*-waves along the orbits, even with the phenomenon of *ec*-conjunction as a driving entity.

7.3 The relation between the period of *ec*-pulsation and the proton model

7.3.1 *Relation with the periods of pp-convergence*

The *ec*'s in the simplified model of a proton move with an average, relative velocity V_P = 0.7399 c at a mean minimum distance $a_{mp} = 6.7425 \times 10^{-17}$ m. In § 3.3.2, an equation has been deduced for the calculation of the period of *pp*-convergence at fast transversal velocity :

$$\Delta t_v = \Delta t.(1\text{-}v/2)$$

In § 2.3 the next relation was found: $\Delta t = A\sqrt{2}/c$.

The period of *pp*-convergence between two neighbour *ec*'s inside a proton may be derived from these two equations:

$$\Delta t_{vp} = \frac{a_{mp}'.\sqrt{2}}{c}\left(1-\frac{V_p}{2c}\right)$$

In this formula the distance a'_{mp} indicates a_{mp} , corrected in two ways:

a) for the eccentricity of the electric *ec*-point (see § 3.5.3)

b) for the most efficient *ec*-packing (see § 5.4.2),

Thus the formula may be written as:

$$\Delta t_{vp} = \frac{k_{am}\cdot\left(a_{mp}-2e_{ex}\right).\sqrt{2}}{c}\cdot\left(1-\frac{V_p}{2c}\right) = 1.89467\,\mathbf{x}10^{-25}\,s$$

in which e_{ex} = 0.140625 r_e , and k_{am} = 0.9726.

Rounded off, the period of *pp* -convergence between two neighbour proton *ec*'s is:

$\mathbf{\Delta t_{vp} = 1.89 \times 10^{-25}\ s}$

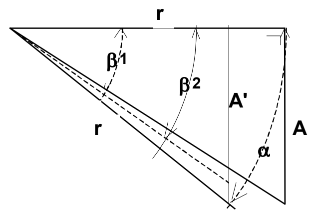
Now the ratio between this period and the period of *ec*-pulsation can be estimated:

$$\frac{2.\Delta t_{vp}}{t_{pe}} = \frac{2\,\text{x}\,1.89\text{x}10^{-25}}{1.26\text{x}10^{-25}} = \boldsymbol{3.00}$$ Normal interaction, see § 5.2.

7.3.2 *Relation with the curves of proton ec's*

An other relation can be indicated, namely the relation between the period of *ec*-pulsation and the curve that is covered averagely by an *ec*, in the *pp* -field of another *ec*, in the period of *pp*-convergence.

Figure 49



During the period Δt_{vp} the *ec*'s in nucleons move along tracks between straight lines and circles. To describe these tracks in the period Δt_{vp}, not only the average of the angles α and β_1 in **figure 49** has to be considered, but also the average of the angles α and β_2.

With respect to the proton model the following equations are relevant:

$A = \Delta t_{vp}.V_P$; α = A radians ; $r = k_{am}.(a_{mp} - 2e_{ex})$

$\beta_1 = tg^{-1}(A/r) = tg^{-1}\{V_P.\sqrt{2}.(1-V_P/2c)/c\}$, thus

$\beta_1 = tg^{-1}(0.65927)$ = **33.396°**

$\alpha = (180/\pi) \times 0.65927$ = **37.773°** ; A' = r.sinα, or A' = 0.61253 r

β_2 = (180/π) × 0.61253 = **35.096°**. The total average amounts to:

β = (1/4) × ($\beta_1 + \alpha + \beta_2 + \alpha$) = **36.0°.**

The curve, which is averagely covered during the period Δt_{vp} measures 36°, by the influence of 1.5 *ec*-pulses. In principle, 10 Δt_{vp}-periods with 15 *ec*-pulses can force each *ec* into a complete tour of 360°.

Complete tours, with whole-numbered ec-pulses, may be the base of the exchange of energy in quanta by material systems. With that it may be the base of quantum mechanics as well.

In one of the following paragraphs this subject will be met again and it will be shown then, that *ec*-conjunctions in nucleons play an important role.

7.4. Relation between the period of ec-pulsation and poëls

The period of *ec*-pulsation even gets more perspective if it is compared with the period of *pp*-convergence within the poël (stable positron-electron pair).

As is deduced in § 3.5.5, both *ec*'s of the poël revolve around each other at a distance r_m = 5.40975 × 10^{-15} m, with a relative velocity v_m = 0.6662 c. Taking the eccentricity of the electric *ec*-point, e_{ex} = 0.140625 r_e, into account, the period of *pp*-convergence within the poël is equal to:

$$\Delta t_{vm} = \frac{(r_m - 2e_{ex}).\sqrt{2}}{c} \cdot \left(1 - \frac{v_m}{2c}\right), \text{ thus: } \mathbf{\Delta t_{vm} = 1.701 \times 10^{-23}\ s}$$

Evidently, a whole number of *ec*-pulses fits into the period Δt_{vm}:

$$\frac{\Delta t_{vm}}{t_{pe}} = \frac{1.701 \text{x} 10^{-23}}{1.26 \text{x} 10^{-25}} = \mathbf{135}$$

From § 3.5.5 we know that the period of poël rotation measures:

$\mathbf{t_m = 10 \times \Delta t_{vm}}$, thus $\mathbf{t_m / t_{pe} =}$ ***1350***

The ratio between the periods of *pp*-convergence of a poël and of neighbour *ec*'s in protons is also an integer:

$$\frac{\Delta t_{vm}}{\Delta t_{vp}} = \frac{1.701 \text{x} 10^{-23}}{1.89 \text{x} 10^{-25}} = \mathbf{90}$$

The conclusion of these speculations must be that the period of *ec*-pulsation, t_{pe} = 6.3 × 10^{-26} s, seems to be of great importance to all *ec*- structures.