

Unified E/M waves theory

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May 2019

Abstract. The accelerated electron creates the inductive-inertial phenomenon, whose the forces act on the electric units of dynamic space, forming the grouping units, namely the electric charges or forms of the electric field. This phenomenon is the precondition to construct E/M waves, while the cause for the generation of E/M formations is the spin oscillations of the electron.

Keywords: Inductive phenomenon; grouping units; cohesive pressure.

PACS numbers: 03.50.Kk, 12.10.-g, 13.40.-f

1. Inductive phenomenon as a precondition of E/M waves

By the unified theory of dynamic space,^{1,2} the inductive-inertial phenomenon³ of the accelerated electron and the inductive forces³ has been developed, which act on the electric units⁴ of dynamic space, forming the grouping units,³ namely the electric charges or forms of the electric field. So, a pressure difference³ ΔP in front of and behind the electron is created and forces on pairs of vertical meridians⁵ of the electron motion formation are accumulated as forces talantonion⁶ f_τ , which are released by a mechanism that in section 2 will be described.

The fundamental E/M wave of frequency

$$\nu_\tau = 10^5 Hz, \quad (1)$$

defined as the endurance frequency of the dynamic space,⁷ corresponds to a liberated force talantonion f_τ . This frequency is known from Thomson's oscillating circuit, in which the radiation emission starts at about the indicative limit frequency $\nu_\tau = 10^5 Hz$, corresponding to

$$\lambda = \frac{C}{\nu_\tau} = \frac{3 \cdot 10^8}{10^5} = 3 \cdot 10^3 m \Rightarrow \lambda = 3 \cdot 10^3 m \Rightarrow L = \lambda = 3000 m, \quad (2)$$

the so called photon length.⁸

The photon frequency ν_n with a number n forces talantonion-fundamental E/M waves is

$$\nu_n = \frac{C_0}{\lambda}, \quad (3)$$

where

$$\lambda = \frac{L}{n} \quad (4)$$

the corresponding wavelength of the photon with a length⁸ $L = 3000\text{m}$ (Eq. 2), which is formed in a helix length⁸

$$\pi L = \pi 3000\text{m}. \quad (5)$$

So, the photon frequency ν_n , due to Eqs 3 and 4, is

$$\nu_n = n \frac{C_0}{L}, \quad (6)$$

where the frequency

$$\nu_\tau = \frac{C_0}{L} \quad (7)$$

is of the fundamental E/M wave (Eq. 1) and so the photon frequency becomes

$$\nu_n = n\nu_\tau. \quad (8)$$

Hence, the photon frequency ν_n is a multiple of the endurance frequency $\nu_\tau = 10^5\text{Hz}$ (Eq. 1) of the dynamic space.

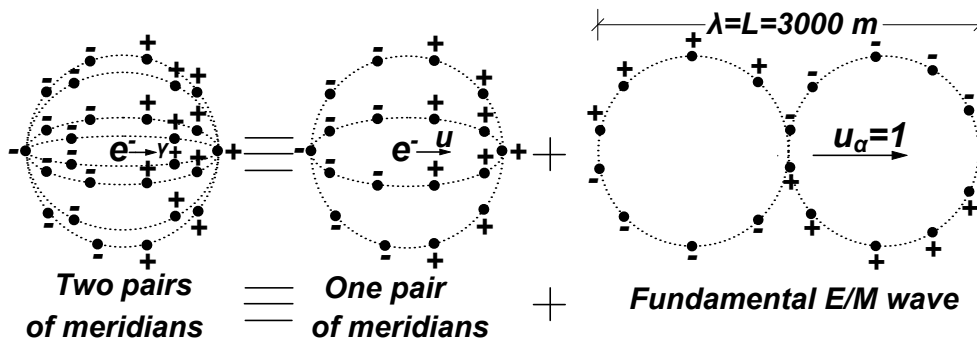


Figure 1. Accumulation of two forces talantonion ($2f_\tau$) on two pairs of motion meridians on an accelerated electron, emission of a talantonion ($1f_\tau$) as fundamental E/M wave, while the other talantonion ($1f_\tau$) remains into the motion formation, maintaining constant the uniform motion of the electron

Schematically, Fig. 1 shows the accumulation of two forces talantonion ($2f_\tau$) on the accelerated electron and the emission of a talantonion ($1f_\tau$) as a fundamental E/M wave ($L = \lambda = 3000\text{m}$), while the other talantonion ($1f_\tau$) remains into the motion formation of the electron, maintaining constant the uniform motion of the electron.

The emission of a talantonion took place, because the acceleration of the electron exceeded the endurance limit of the dynamic space, which constitutes the way of forces

accumulation on the motion formation of the electron. Therefore, by changing the kinetics of the electron, the forces talantonion are accumulated as a result of the inductive phenomenon and for a most strong change, an emission of half quantity of accumulated forces talantonion happens. Here, we note the difference from Maxwell's theory, which interprets the E/M waves as a change of the kinetics of the electron, while unified theory^{1,2} interprets them as the spin oscillations of the electron (section 2).

2. Spin oscillations of electron as a cause of E/M formations

The release mechanism of the above forces talantonion (section 1) from the motion formation is the spin oscillations of the electron. By the unified theory,^{1,2} the spin⁹ of the particles is described, due to the differentiation of the surface charges, which change the cohesive pressure P_0 ,⁷ creating at the periphery of the particle a pressure difference ΔP , that is the cause of its spin. However, when an electron is located at a strong electric field, the change of the cohesive pressure close to the electron affects the ΔP of the electron spin and imposes reverse spin oscillations by -1 , namely from $+1/2$ to $-1/2$ and vice versa. The frequency of these spin oscillations depends on the intensity of the electric field that accelerates the electron.

The spin oscillations of the electron happen higher from the indicative limit frequency of $\nu_\tau = 10^5 \text{Hz}$ (Eq. 1), at which E/M radiation can be emitted. This limit of the spin oscillations of the electron is the cause of forming a half talantonion from motion meridian⁵ to a fundamental E/M formation within the quantum time¹⁰

$$\tau = 10^{-5} \text{sec}, \quad (9)$$

corresponding to the above endurance frequency ν_τ of the dynamic space.

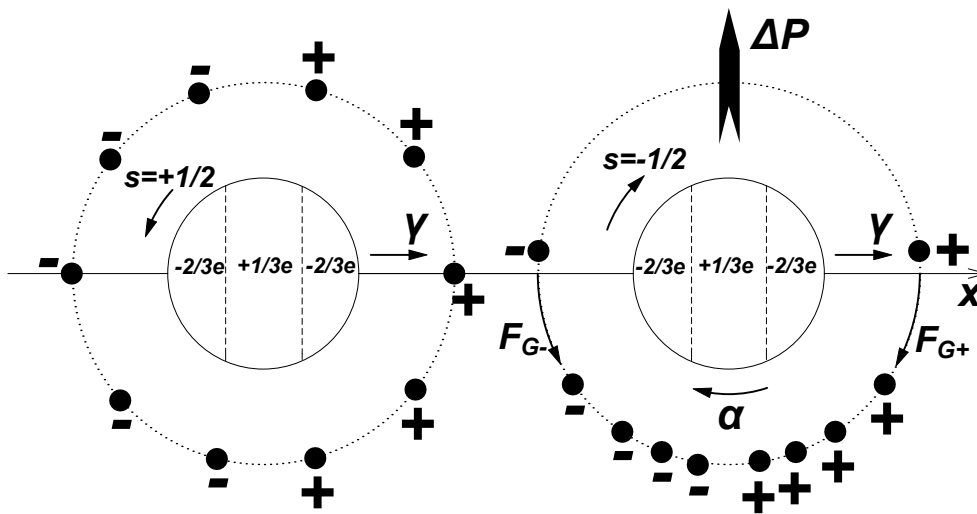


Figure 2. Reversion of the electron spin ($s = +1/2$ to $s = -1/2$), accumulation of the grouping units downwards and development of the motion arrow ΔP upwards

The change of the electron spin from $s = +1/2$ to $s = 0$ (Fig. 2) causes the angular deceleration a of the surface negative charges of the electron, whereby the inductive

forces³ F_{G+} and F_{G-} act to the first grouping units and resulting to the compression of positive and negative units downwards.

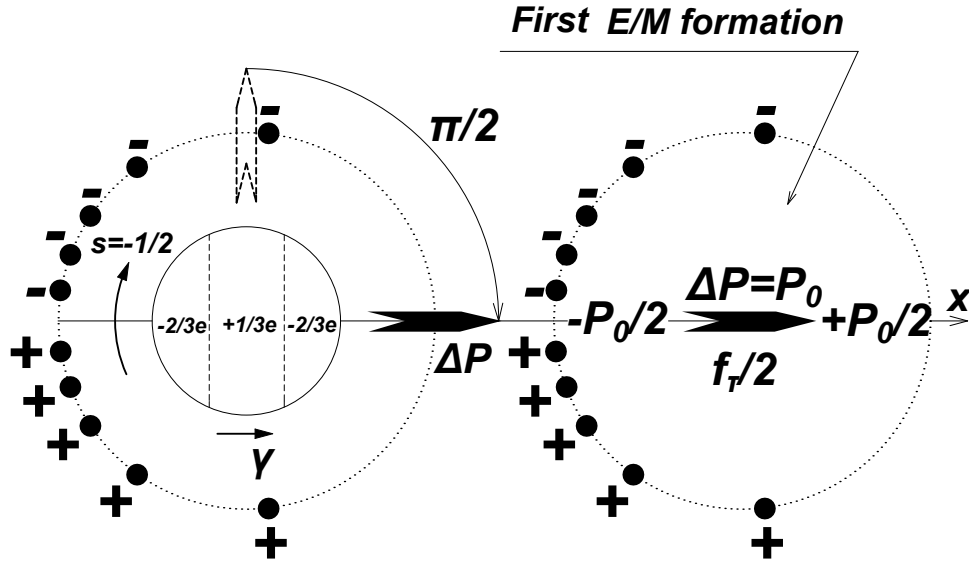


Figure 3. Turning of the motion arrow ΔP by $-\pi/2$ and of the whole motion meridian and its exit as a first E/M formation

Subsequently, the change of the electron spin from $s = 0$ to $s = -1/2$ causes the angular acceleration a of the surface negative charges of the electron and the inductive forces F_{G+} and F_{G-} compress furthermore downwards the first grouping units, creating the motion arrow³ ΔP upwards and vertically to the motion direction.

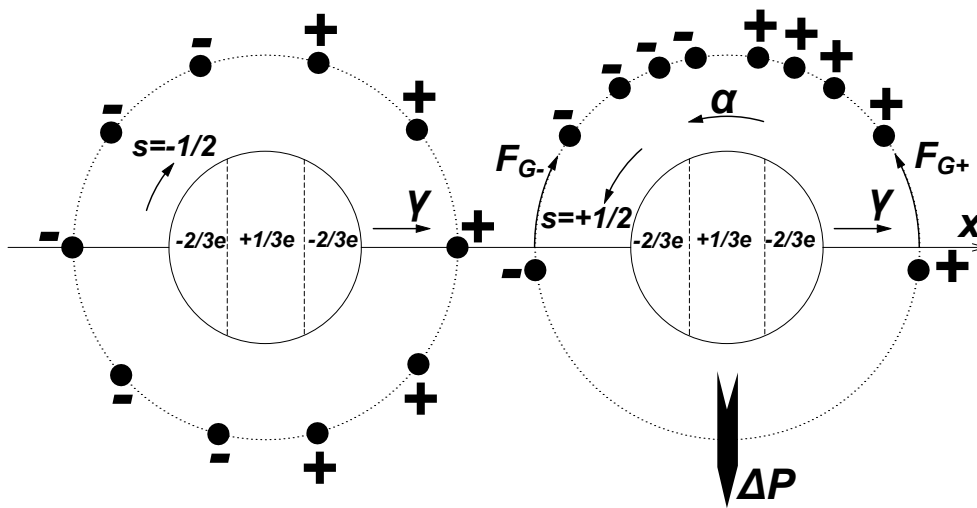


Figure 4. Reversion of electron spin ($s = -1/2$ to $s = +1/2$), accumulation of the grouping units upwards and development of the motion arrow ΔP downwards

However, under the influence of the electron motion, this arrow and the whole motion meridian turns by $-\pi/2$ (Fig. 3) and becomes parallel to the direction of the

electron motion (principle of momentum conservation). The above motion meridian exits as a first E/M formation, which contains a half force talantonion ($f_\tau/2$).

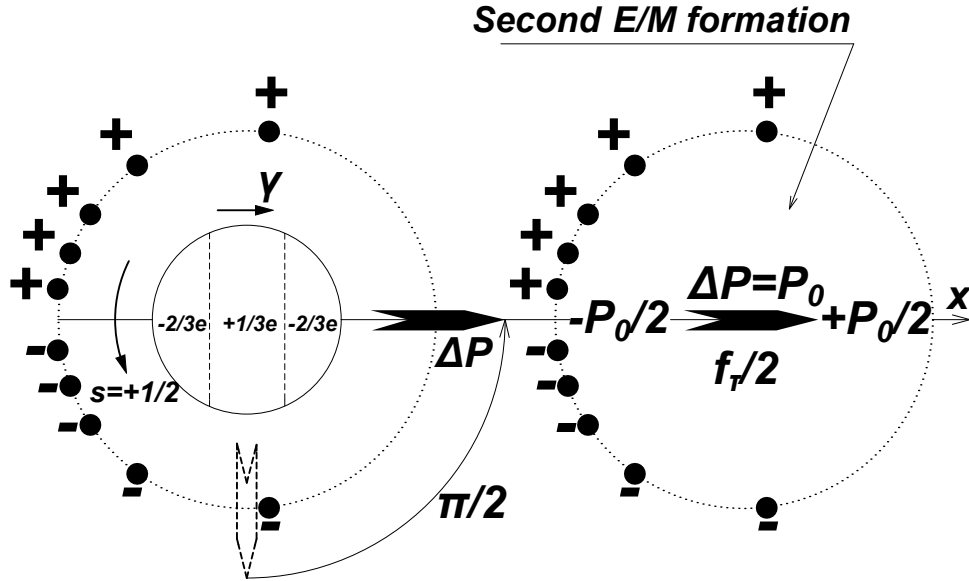


Figure 5. Turning of the motion arrow ΔP by $+\pi/2$ and of the whole motion meridian and its exit as a second E/M formation

The same procedure is repeated during the change of the spin from $s = -1/2$ to $s = +1/2$, followed by the compressing upwards of the positive and negative units of the meridian (inductive phenomenon), resulting to the motion arrow ΔP downwards now (Fig. 4), whereby its rotation follows by $+\pi/2$ (Fig. 5) and the exit of this motion meridian happens as a second E/M formation of half force talantonion ($f_\tau/2$). Therefore, the reversion of the electron spin creates an inverted E/M formation.

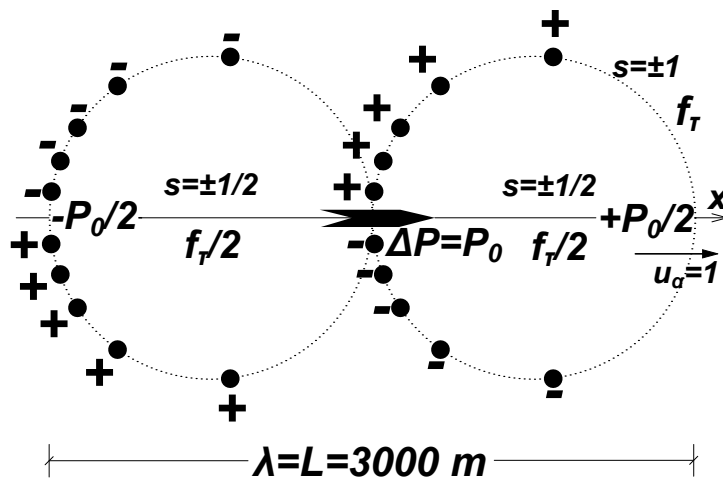


Figure 6. The two E/M formations of figures 3 and 5 compose the fundamental E/M wave with a spin $s = +1/2 + 1/2 = +1$ or $s = -1/2 - 1/2 = -1$ and an accumulated force of one talantonion ($f_\tau = f_\tau/2 + f_\tau/2$) and a wavelength $\lambda = L = 3000\text{m}$

These two E/M formations of Figs 3 and 5 each one of half talantonion, compose the fundamental E/M wave (Fig. 6) of one talantonion for the limit frequency $\nu_\tau = 10^5 \text{Hz}$ (Eq. 1), namely the spin oscillations of the electron. Thus, the fundamental E/M wave has a frequency

$$\nu = \nu_\tau = 10^5 \text{Hz} \quad (10)$$

and a wavelength λ , which coincides with the so called photon length L , that is $\lambda = L = 3000\text{m}$ (Eq. 2).

It is obvious that, in any spin oscillation of the electron there correspond two opposite reversion of the spin ($+1/2 - 1 = -1/2$ and $-1/2 + 1 = +1/2$) and, therefore, two opposite E/M formations correspond to a fundamental E/M wave. Here, the principle of antithesis (opposition) applies, according to which all natural phenomena are structured. Therefore, the fundamental E/M wave consists of two E/M formations with opposite spindles of a diameter $\lambda/2$, that are released from two vertical motion meridians of the electron and move at the light speed¹¹

$$C_0 = \sqrt{\frac{P_0}{d_m}}, \quad (11)$$

i.e. the transmission speed of the disturbance into the tense elastic-dynamic space, where P_0 the cohesive pressure and d_m the Universal constant mass density¹² of space.

3. E/M waves move at light speed

By the unified theory,^{1,2} the timeless speed u_a of a particle has been found¹³ equal to

$$u_a = \frac{F_s}{F_\tau} = \frac{F_s}{\sqrt{F_0^2 + F_s^2}} \Rightarrow u_a = \frac{F_s}{\sqrt{F_0^2 + F_s^2}}, \quad (12)$$

where F_0 is the gravity force of the particle that does not accompany the E/M wave. So, for

$$F_0 = 0 \quad (13)$$

the Eq. 12 becomes

$$u_a = \frac{F_s}{\sqrt{F_0^2 + F_s^2}} = \frac{F_s}{F_s} = 1 \Rightarrow u_a = 1, \quad (14)$$

namely equal to the constant timeless speed¹³ of light $u_a = 1$ ($u_a = u/C_0$, where $u = C_0$, so $u_a = 1$).

Also, the timeless speed u_a of a particle is

$$u_a = \sqrt{\frac{\Delta P}{P_0}} \quad (15)$$

and for $u_a = 1$ (Eq. 14) it is

$$\Delta P = P_0 \Rightarrow \Delta P = \left(\Delta P + \frac{P_0}{2}\right) - \left(\Delta P - \frac{P_0}{2}\right) = P_0, \quad (16)$$

i.e. equal to the pressure difference³ in front of and behind the E/M wave.

Therefore, the E/M wave actually moves at the light speed (Eqs 11 and 14), which is reached by using the whole chaotic cohesive pressure¹⁴ of space

$$\Delta P = P_0 = P_{0x} = 0,7777 \cdot 10^{151} N/m^2 \quad (17)$$

as a pressure difference $\Delta P = P_0$ (Eq. 16) in front of and behind the E/M wave.

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