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A NEW ASPECT OF PLANCK'S CONSTANT

Milos Abadzic, Belgrade, Serbia

milabster@gmail.com

ABSTRACT.

Determination of Planck's constant had to a great extent, a factual characteristic, like determining the speed of light. Some terms and values which were obtained, reflected real relations although the scientists were unaware of the characteristics and mechanisms of the processes involved. From today's point of the view, we cannot determine the extent of their knowledge from the erroneous hypotheses and theories which appeared later. The physical and the mathematical models presented, disturb the coherence of the real physical appearances and processes - merely confusing the understanding of what happens in nature. In this article, I have attempted (and I believe successfully to a great extent,) to take advantage of Planck constants for determining the characteristics of one of the sub-elemental magnitudes. The analysis is limited to elektrions, but would presumably apply to all other particle systems, with a certain degree of freedom in systems connected with elastic interactions. One of the important results of this analysis is that the carriers of electromagnetic processes are particles with electrical charges that are less than the charges of electrons and quarks. These data refute the theories associated with the Standard model which it seeks to correct. The purpose is not in introducing many smaller particles, but to point out the need to reassess theories that rely on the Standard model, such as the theory of relativity and quantum physics. From this analysis, there ensues some new approaches mentioned in the conclusions at the end of this article.

1. PLANCK'S CONSTANT AT THE SUB-ELEMENAL LEVEL.

Planck's constant represents the beginning in quantizing energy processes, which later evolved into RT and QT especially, although its importance and possible influence on natural processes is not yet explained. This is probably because the processes associated with electromagnetic waves (EMW) was not well understood. Unfortunately this state of affairs has not changed. However, the value of the Planck's constant was not based on the real physical mode of wave processes, and is not only for the determination of the energy of EMW. It represents a way to explain the real nature of the carriers of these processes. I think that all theories which the value of this constant offers are not yet understood. In order to understand, there must first be a logical physical model of electromagnetic processes acting in the background of what is represented as Planck's constant. Moreover, there is the need to correct some assumptions regarding Planck's constant as well.

1.1. MEANING OF PLANCK'S CONSTANT.

1.1.1. MODEL OF ELECTROMAGNETIC PROCESSES.

To define a physically model of the processes that are involved with electromagnetic waves, there must be established a physical picture of the space in which the processes act. In the NMN model, its space is on a sub-elemental level implemented alternately, and evenly distributed by pozions and negions. From a macroscopic viewpoint, this space is electrically neutral, notwithstanding that around every particle is an electrostatic field. Every disturbance within the arrangement of sub-elemental particles relates to a violation of this neutrality and to the transient electromagnetic

process which spreads over the surrounding space. All elektrions within the space of the universe are mutually related by interacting forces, which have an elastic character and are the result of a reaction of the complete system to the disturbance, and its attempt to re-establish the new equilibrium state. The result in the reaction and nature of those forces is that a disturbance to the position of some particles leads to its returning to the former equilibrium state or changing the distribution within a space encompassing the area where the disturbance arose. Regarding the particles with electrical charge, their movement is in conjunction with the appearance of magnetic fields around the plane of their oscillation, and also to the appearance of changeable electrostatic fields which are dependent on the motion within the observed particle system. The magnetic field and changes in the electrostatic field have an oscillatory character and represent processes which spread from one to another by an electromagnetic wave. In the course of this process it is possible that these particles would act on some new charged particles or electromagnetic waves[1]. Then their movements become more complicated and act multi-frequently.

This model establishes a substance with defined physical characteristics that is the carrier of the process. I name this substance the ether, but now it has quite a definite and unambiguous character. It is at the base of physical properties in the model of EMW. The observed structure is homogeneous and does not interact with materions which are distributed in a similar way within universal space.

In addition, the theory must take care of the accepted hypothesis about the speed of establishing the fundamental and derivative states to which the magnetic fields also belong. This establishes hypotheses that are virtually endowed with speeds that are many orders of magnitudes greater than the speed of light.

1.1.2. THE MEANING OF PLANCK'S CONSTANT

Determining the values of Planck constant is assessed as a function of the frequency of an electromagnetic wave. Therefore the magnitudes which have only integer values, reduce to one second. Weightiness results if the conducted research be situated within an environment that enhances the frequency to increase the value of emitted energy within one second by a value equivalent to the initial value. That is to say that energy emitted during one periodic time has same unchangeable value disregarding the frequency observed in the EMW. The value determine by Planck is,

$$(1) \quad h = 6{,}626063(11) \cdot 10^{-34} \quad [J \cdot s]$$

The multiplication this constant by the frequency of the EMW gives the value of its energy

$$(2) \quad W = h \cdot f \quad [J]$$

I regard this dimension to be incorrect. Formally observed, the energy, whether it becomes this value through the frequency of some EMW, represents the energy this wave has for a unit of time. Accordingly a definition of this magnitude goes under the name of power, with units [W].

Only its multiplication by the duration of the observed wave can we obtain an adequate amount of emitted energy. Then the dimension of Planck's constant must be [J]. The whole process has an energetic character whose intensity s changes in the course of time periods. This fact wasn't fundamental to in the experiments, because of the sliding rule with rational numbers of time

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[1] This model of EMW itself differs by model that I have uses within (L1), which has based itself on the existence of elektrions dipoles as the carrier of these electromagnetic processes. Later analysis indicates that the model with evenly alternately distributed pozions and negions is more real and in consonance with the general model of wave processes presented within (L2). Within both variants of the model, the carrier processes are elektrions of both polarities, the sole distinction is by their distribution within universal space and the character of the reactions are determined by the disturbances of their distributions.

periods. Its means that it equates with the average values of some functions whose value change in the course of time periods between zeros and some ± maximum values, with relation to the law of sines. The function represents the power that appropriate sources emit within the environment. Its expression is

$$(3) \quad h(t) = h_m \cdot \sin \omega \cdot t = h_m \cdot \sin(2 \cdot \pi \cdot f) \cdot t \quad [W]$$

Wherein are:

h (t) time function of Planck's constant,

h_m maximal value of this function,

f frequency of observable wave process.

Whether energy will be emitted in the course of one's time period *t* is defined in the appropriate integration of these functions

$$(4) \quad W(t) = h_m \int_0^T |\sin(2 \cdot \pi \cdot f)| \cdot t \cdot dt \quad [J]$$

The value of these functions in the course of one period is the amount of energy emitted.

$$(5) \quad W(T) = h_m \int_0^T |\sin(2 \cdot \pi \cdot f) \cdot t \cdot dt| = \frac{2 \cdot h_m}{\pi \cdot f} = \frac{2}{\pi} \cdot h_m \cdot T = h = const. \quad [J]$$

With regard to the Planck results, the values are constant and equal to measured values regardless of the frequency of the EMW

$$(6) \quad h = \frac{2 \cdot h_m}{\pi \cdot f} \quad [J]$$

What is possibly provided is the peak value of these functions proportional to the frequency of the observed EMW, which follows from (5)

$$(7) \quad h_m = \frac{\pi}{2} \cdot h \cdot f = 1{,}0408 \cdot 10^{-33} \quad [W]$$

To determine the emitted energy of some radiation source over time *t* it should represent the sum of values approaching expression (5) for all time periods within the observed time interval

$$(8) \quad W(t) = \sum_1^n W(T)$$

Where *n* is a dimensionless number of realized time periods of the EMW and has the value,

$$(9) \quad n = \frac{t}{T}$$

The energy is defined by the Planck equation, and according to (7) the power, because *f* has the dimension [s^{-1}]. Even formally it can not be that expression (2) is correct. Firstly, their dimensions do not agree because the frequency is the reciprocal value of the time period only, and it is their dimensions also. By the ratio of (8) we have:

$$(10) \quad \frac{t(s)}{T(s)} = n \quad [-]$$

Secondly, if the radiation process lasts for over one second, expression (2) is no longer correct. It can be used to $t=1$[s] only, because then the power and the energy are numerically adequate but not physically. For all others instances, when is $t \neq 1$ [s], expression (8) must be used. It is,

$$W(t) = h \cdot n \quad [J] \tag{11}$$

From this follows that in order to change the dimension of Planck's constant an action is required fixing the energy of the EMW within some time intervals different than 1[s].

By this observation of energetic processes by EMW a discrete string of values is obtained, because every frequency increases the energy to one shifted within the diagram *energy - time* to the value of *T*. If the process terminates between points, the value will be more or less than the real value of emitted energy. With a higher frequency than the usual frequency of EMW, the change will be negligible but with quite a low frequency, it would be measurable. However, from the physical viewpoint, the wave's process must terminate with a reestablished balanced state. This means that the frequency is always an integer (with a proviso that it can transmogrify duration periods in the course of observable process). Then the errors are not noticeable thanks to the constant value of Planck.

The entire action in the determination of Planck constant, according to the previous analysis, must include the physical nature of an electromagnetic wave. This constant doesn't mark some process, it is only an energetic manifestation of the appropriate processes within which the electrions participate, so we can say that the complete action has a formal character. Planck's constant is only one experimentally determined physical magnitude which is in direct correlation with carriers of the electromagnetic process within an EMW, whose conduct must be bound by the defined physical laws. In the following, I try to find the link.

It shall keep in mind that this is possible solely when taken within the contet of one type of particle, in this case, electrions of both polarities. Electrions don't interact with materions, that also occupy the observed space of the universe, similar to electrions.

1.2. ADDITIONAL ANALYSE OF PLANCK CONSTANT.

If using an experimental certified magnitude such as Planck's constant it is worthwhile to take pains and reconsider all the capabilities it offers in explaining natural processes and the characteristics of their carriers, electromagnetic waves. A starting point to such an analysis must be the previously described model of the EMW as defined carriers of processes. I lean on the NMN model defined further on. My observation is concentrated on the behavior of one election influenced by some disturbance, and the reaction of the system. This analysis of processes will include two facets:

- Make the correlation of energy ratios by both wave's processes and the process of non-cyclical movement of electrions.
- Determine the fundamental characteristics of the carriers of wave processes.

For this analysis, the need is to take a more in-depth look at processes by EMT from the aspect of one participant, the electron regardless of the polarity of its electrical charges. The conduct of one electrion responding to some disturbance may be written up as follows:

- Process has an interaction character and represents a reaction to a system in a state of change, herein causing a motion of the electrical charge.
- Motion of the electrion is a consequence of the momentum that to it gives the cause of the disturbance on one hand, and the resultant interaction forces which act on it. The result is a reaction by the system against the disturbance to which the electrion is exposed.

- Elektrion's movement is linear and represents a temporary deviation from its steady state and subsequent return to it[2].
- The speed of the electrions starts with zero, attains the maximum after *T/4*, reaches the maximal value at *T/4*, and, when its own actuated momentum equals the system's reaction, the speed falls to null at *T/2*. Then it comes back to its primary steady state under the influence of the system's reaction. The process itself repeats for every subsequent period of EMW if the disturbance's source acts continuously (as a new charged particle or becoming an electromagnetic wave). Energetic effects are summarized for the complete period *T*.
- The observation of the movement of the electrions is limited to one quarter of period T. During that time it would emit one quarter of the energy determined by expression (5).

1.2. 1. ENERGETIC RELATIONS.

Energetic processes by electromagnetic wave may be determined by application of Planck's expression, and also may be analyzed by observing electrions as particles with linear motion. This analysis is a true reflection of physical processes that are represented as electromagnetic waves. This allows pre-determination of the characteristics their motion and expresses the energy of accelerated charged particles, in this case the election. This leads to an expression for energy increase for charged particles, in this case, the elektrion, which is,

$$(12) \quad W_v = \frac{1}{2} \cdot \frac{\mu_o \cdot e_e^2}{6 \cdot \pi \cdot r_e} \cdot v^2$$

Within expression (12) are

μ_o Magnetic permeability of free space,

e_e Electrical charge of electron,

v Electrion speed

r_e Electrion radius.

Within this equation, the unkknown magnitudes are electric charge of the electrion and its radius, but they are constants and it is possible to write

$$(13) \quad W_v = K_v \cdot v^2$$

Where K_v is an associated constant, and the expression represents a square function. This well-used equation represents the classical equation for kinetic energy, in which the constant K_v represents an equivalent electrical mass for the electrion.

In principle, expression (13) might be use to determine the emitted energy in the course of wave processes under the following circumstances:

- The speed of the electrions change four times during one period from zero to some maximum values.
- Energetic processes repeat every quarter period and before expiration.

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[2] Within this analyze we watch a single disturbance only whose carrier after the interaction remains in this area and has no influence on the process.

- Change of the election's speed is continual in the course of the one quarter of a period and follows the sine law.

$$(14) \quad v(t) = v_m \cdot \sin(2 \cdot \pi \cdot f) \cdot t$$

Value of the functions $v^2(t)$ in the course of *T/4* i

$$(15) \quad v^2\left(\frac{T}{4}\right) = v_m^2 \int_0^{\frac{T}{4}} sin^2\,(2 \cdot \pi \cdot f)t \cdot dt = v_m^2 \cdot \left|\frac{1}{2} \cdot t - \frac{1}{4 \cdot (4 \cdot \pi \cdot f)} \cdot \sin(4 \cdot \pi \cdot f) \cdot t\right|_0^{T/4}$$
$$= v_m^2 \frac{T}{8}$$

Effective value of these function in the course of *T/4* is.

$$(16) \quad v_{ef} = \frac{1}{\sqrt{2}} \cdot v_m \cdot \frac{\sqrt{T}}{2 \cdot \sqrt{2}} = \frac{1}{4 \cdot \sqrt{f}} \cdot v_m$$

Energy the elektrion has during quarter periods is in this case,

$$(17) \quad W_v^{'} = K_v \cdot v_{ef}^2 = \frac{1}{8} \cdot K_v \cdot v_m^2 \cdot \frac{1}{f}$$

Energy to complete periods would be

$$(18) \quad W_v = 4 \cdot W_v^{'} = \frac{1}{2} \cdot K_v \cdot v_m^2 \cdot \frac{1}{f}$$

Energy determine by expression (18) must be equal to the energy of EMT determined by the Plank expression,

$$(19) \quad h = \frac{1}{2} \cdot K_v \cdot v_m^2 \cdot \frac{1}{f}$$

Without analyzing the change of speed *v* in the course of one period within equation (14) these two energies must be the same at the end of every period of the observed EMW. We can determine the energy values for complete periods, with relation to every value of the frequency. Considering equation (11), these points will be a strait line in system $W(f)$ or $W(n)$ who's coefficient of direction is Planck's constant *h*. Linearity shall be assisted by equation (13) but within system $W(v_{sf}^2)$. At these point values, the energy function will be the same. Expression (19) can be written.

$$(20) \quad h \cdot f = \frac{1}{2} \cdot K_v \cdot v_m^2$$

With this analysis we can come to the conclusion that where magnitudes *h* and K_v are constant, between frequency f and speed v_m^2 there exists the relation

$$(21) \quad v_m = \sqrt{f} = \sqrt{\frac{1}{T}}$$

In the case where frequency f and speed v_m have a value equal to one, then between constant magnitudes within expression (20) exists the relation

(22) $$h = \frac{1}{2} \cdot K_v$$

And

(23) $$K_v = 2 \cdot h = 1{,}3252 \cdot 10^{-33}$$

In order to maintain this linearity, the numerical value of v_m, as the motion of the electrical charge, must correlate with the numerical value of the frequency according to expression (21). However, there is a fundamental difference between these, which determines the energies values of observable particles:

- In contrast to Planck's constant, the movement and speed of electrions are physical appearances and processes that depend on the characteristics of the environment where this process spreads as a disturbance, which is the cause the their motion.
- The energetic states of the electrions by EMW are changed by the integer values of the frequency. These change is witnessed by observation of the motion of the electrions during their oscillation as the carriers of EMW, because the value changes four times from zero to some maximum value within one period..
- By a noncyclical movement of the elecrions, a change in their energetic state is continual, because the change in speed is not a discontinuous function but represents the process which is developed by the uninterrupted act of becoming force.

1.2.2. DETERMINING THE ELECTRION'S CHARACTERISTICS.

For , the need is to determine several magnitudes which originate from the motion of electrions by the spread of EMT. Mass, in the case of particles with electrical charge shows itself in the appearance of Coulomb forces whose size by two electrions is defined in the expression

(24) $$F_e = \frac{1}{4 \cdot \varepsilon_o \cdot \pi} \cdot \frac{e_e}{r^2} = k_{em}^2 \frac{e_e^2}{r^2}$$

Here,

e_e Electrical charge of electrions,

r Distant between elektrions,

ε_o Dielectric constant of free space.

Within the above expression, k_{em} represents the coefficient transposition of electrical charges to the mechanical level. So we would designate the electrical charge transposed to the mechanical level as a reduced electrical mass electrion. It is

(25) $$e_{em} = k_{em} \cdot e_e = \frac{1}{\sqrt{4 \cdot \pi \cdot \varepsilon_o}} \cdot e_e = \frac{1}{\sqrt{4 \cdot \pi \cdot 8{,}8542 \cdot 10^{-12}}} = 9{,}4803 \cdot 10^4 \cdot e_e$$

Considering this as fundamental, the mean value of the speed is,

(26) $$v_{sr} = \frac{v_m}{2} = \frac{\sqrt{f}}{2}$$

Also we can use the mean value of acceleration until the electrion reaches its maximum speed by *T/4*

(27) $$a_s = \frac{v_{sr}}{\frac{T}{4}} = 4 \cdot v_{sr} \cdot f = 2 \cdot f^{\frac{3}{2}}$$

Half of the electrion's path (when its speed has the maximum values) is

(28) $$\frac{l}{2} = v_{sr} \cdot \frac{T}{4} = \frac{1}{8 \cdot \sqrt{f}}$$

Mean value of the forces which act on the electrion in the course of path *l/2* may be determined as

(29) $$F_s = \frac{h \cdot f}{4 \cdot \frac{l}{2}} = \frac{h \cdot f}{\frac{1}{2 \cdot \sqrt{f}}} = 2 \cdot h \cdot f^{\frac{3}{2}}$$

Alternately, the mean value of forces can be determined classically across acceleration and masses, which in this case is the reduced mass of the elektrion,

(30) $$F_s = e_{em} \cdot a_s = k_{em} \cdot e_e \cdot 2 \cdot f^{\frac{3}{2}}$$

By equalizing expressions (29) and (30) we obtain

(31) $$e_e = \frac{h}{k_{em}} = \frac{6{,}626 \cdot 10^{-34}}{9{,}4803 \cdot 10^{4}} = 6{,}9892 \cdot 10^{-39}$$

With these values of e_e and expression (24) we may determine the radius space completely with electrical charge of the election

(32) $$r_e = \frac{\mu_0 e_e^2}{6 \cdot \pi \cdot K_v} = \frac{12{,}566 \cdot 10^{-7} \cdot (6{,}9892 \cdot 10^{-39})^2}{6 \cdot \pi \cdot 1{,}3252 \cdot 10^{-33}} = 2{,}4574 \cdot 10^{-51} \quad [m]$$

From a comparison of the electrical charges of both electrions and electrons, it follows that within the electron there needs to exist the following number of elections

(33) $$N_e = \frac{e}{e_e} = \frac{1{,}6021892 \cdot 10^{-19}}{6{,}9892 \cdot 10^{-39}} = 2{,}2924 \cdot 10^{19}$$

By this analysis of energetic processes within space occupied by a uniform distribution of electrions, we may find their possible fundamental characteristics, such as their electrical charge and radius. Here, and in my other articles, where I utilize point particles I derive these orders of magnitude.

1.3. PROBLEM OF EMW SPEED

1.3.1. SOME FUNDAMENTAL RELATIONS.

The previous analysis does away with some current theories and models connected to the appearance and processes of nature. One of them is the question of the speed of dispersion of the processes across space. The spread of processes doesn't represent the movement of carriers of these processes in the sense that their locations change but is just the result of reaction of the system that the disturbances have on their location. Measurement of these reactions is the change of the energy ratio between the system's components within the space where it happens. These changes are transformation of potential into kinetic energy and the inverse. The reactions represent a law about the minimal potential energy of the observable system (L.1). This law reads as follows:

Every system of particles or their aggregate by action/interaction processes longs to occupy a position and arrangement in which its whole potential energy will be minimal. That means, no matter whether the system is within some dynamic process, that within every moment exists an *arrangement in which it would have minimal energy and to which the system tends. It may be assumed that within* a *given space and contributed interior and exterior conditions, this energy level has a constant value*.

After a disturbance, a new state is established across the transient process whose characteristics are frequency and duration. The process begins in the space where the disturbance acts and spreads itself over the environment. In this process the influences have inertia and other forces, which are relevant to the observed system. Changes can happen from the sub-elemental to the universal space level. If some currently energetic state of a total system designated W_{ps}, that is always dynamic, it will correspond to some hypothetically balanced dynamical energetic state, designate with W_{pr}, characterized by a minimal total potential energy within the observed conditions to which system longs. To every system with an established disposition, there corresponds some new dynamic energetic state with minimal total potential energy. The system will act reactively on the state's changes. The size of these reactions will be proportional to difference between its currently energetically state and this hypothetically balance dynamical the energetic state. The speed of the state's change will be different in every moment because the relation between current and hypothetical states is changeable also. A mathematical model of these energetic relations is

$$(34)\quad \frac{\partial W_p(t)}{\partial t} = k(t)\cdot\left[W_{ps}(t) - W_{pr}(t)\right] = \frac{1}{\tau(t)}\cdot\left[W_{ps}(t) - W_{pr}(t)\right]$$

Where $k = \tau^{-1}\,[\mathrm{s}^{-1}]$ is a coefficient of proportionality with dimension, which is reciprocal to time. This reciprocal value is often in use with the name, time constant of system τ. It is not at all constant at a given magnitude. Its size depends on the energetic state of the observable system as a function of geometrical coordinates and/or times. It is evident that any change of state of a system can not be instantaneous; it represents some process or event whose measure is this time constant within an unobservable moment. Its value within some moment t_1 is

$$(35)\quad \tau(t) = \frac{1}{\frac{\partial W_p}{\partial t}}\cdot\left[W_{ps}(t_1) - W_{pr}(t_1)\right]$$

And it will always have some final value $W_{pr}(t_1)$ as potential energy in t_1.

Any process or appearance that is entertained, involves that can be defined as the *Law of continuity*:.

*All changes of the states and processes within nature happen within time intervals that may be very short, but are nevertheless always definitive. The a*ppearance *of singularities by these changes is impossible. For observing appearance and/or processes, this law represents a serious argument for reassessment of their physical and/or mathematical models*.

Descriptions on the sub-elemental particle level are limited only to potential energy, because menions and mental field forms are in balanced system only. This kind of energy has a static character. However, in lager material structures, when they meet with particles, they exhibit a different kind of motion, it appears as kinetic energy, and is a reflection of the change of the system state and its dynamics, as a dynamics of its components. The amount of cumulative kinetic energy of a system can't be larger than the difference between the instantaneous and minimal

amount of potential energy , because the differences transform partially to kinetic energy and partially on overlying losses (if they exist), which are attendant processes of the motion of some system components. So it can be written for the kinetic energy of a closed system $W_{ks}(t)$

$$(36) \quad W_{ks}(t) \leq \left[W_{ps}(t) - W_{pr}(t)\right]$$

Whereas to give the instantaneous potential energy for the system's balanced states representing constant magnitudes, the change of the systems kinetic energy will be in this moment

$$(37) \quad \frac{\partial W_{ks}(t_1)}{\partial t} \leq \frac{\partial W_{ps}(t_1)}{\partial t} = \frac{1}{\tau(t_1)} \cdot \left[W_{ps}(t_1) - W_{pr}(t_1)\right]$$

If from whatever event comes to hasten a change of potential energy in the observable system, it reflects itself on the character of motion of the particles or structures which initiated the change, and on the states of all other structures within the system. On account of complex interactions, acting within the system, these changes theoretically act on other system components. The effects of these actions depends on the momentum that caused the disturbances, masses of components, and distance of some components from the location of the disturbance.

Our analysis is related to all processes and even to waves. In virtue of it, we can ask: "*What is the speed of process propagation, especially of waves*?" Accordingly, that might suggest other tprocesses in lieu of current assumptions of propagation with some dilation, in which every form of entrants (been they particles or their aggregate) participate in the time delay proportional to their inertia, or time constants, that are reduced to time units. So one value depends on the density of the carrier of appropriate processes.

1.3.2. THE CASE OF ELECTROMAGNETIC WAVES.

EMW represent the energetic disturbance of the system that make both the pozels and the negels uniformly distributed within the space. On the initial location, there occurs an influx of kinetic energy, within which one or more particles move, and violate a formerly-established quasi-stabile state. This process, as experimental research shows, spreads within space at speed *c*, labeled the speed of light. From the aspect of energy processes which create the spread of the electromagnetic wave, this influx is identified by the quantity *hf*. The disturbance and subsequent reaction are not instantaneous and require some time in order to play out. The value of the time constant, determined by expression (36), represents this time delay. It means that the reaction of the system has a time delay in relation to the energetic disturbance. Its latency, which follows from the equation, is dependent on the rate of rise of the disturbance and its values with relation to the previously energetic state. The nature of the concomitant processes are the appearance of a changeable electrostatic field between it and neighboring elektrions and a changeable magnetic field around the trajectory of hit electrions. These fields, especially the magnetic, influence the electrions and they begin to move. The process repeats with every subsequent particle and always it appears with a time delay. The process has a catenaries character and spreads itself across space.

Planck's constant is unable to analysis this problem because it has a formal character, and we must use expression (12), or its variant (13), which is connected with the electrions as properties particles and their behavior within observable conditions. Then we can write for energetic processes ,

$$(38) \quad W_v(t) = \frac{1}{2} \cdot K_v \cdot v_m^2 \cdot stn^2(\omega \cdot t \ )$$

If electromagnetic waves are observed within the context of these energetic processes it is possible to conclude:

- Energy amount of Planck constant, which is $h \cdot f$ or according to expression (18), is the disturbance characteristic.
- Accompanying processes become time constant which tend toward expression (38).
- Time delay, which is a consequence of the these time constants, repeat with every subsequently excitation that follows the interaction of the excited particle with a neighboring non-excited one..
- The spread of the disturbance without this time delay would be -

Time derivation of energy within expression (39) is in this case

$$(39) \quad \frac{\partial W_v(t)}{\partial t} = 2 \cdot \pi \cdot f \cdot K_v \cdot v_m^2 \cdot \sin(\omega \cdot t) \cdot \cos(\omega \cdot t)$$

Time constant value, according to both expression (39) and the disturbance b (19), can be determined as

$$(40) \quad \tau(t) = \frac{1}{2 \cdot \pi \cdot f \cdot K_v \cdot v_{ef}^2 \cdot \sin(\omega \cdot t) \cdot \cos(\omega \cdot t)} \cdot \frac{1}{2} \cdot K_v \cdot v_{ef}^2 = \frac{1}{4 \cdot \pi \cdot f} \cdot k_t(T) = \frac{0{,}07958}{f} \cdot k_t(t)$$

Where $k_t(t)$ is

$$(41) \quad k_t(T) = \frac{1}{\sin(\omega \cdot t) \cdot \cos(\omega \cdot t)}$$

Arguments within trigonometric functions in (41) have very small values and it is possible to write

$$(42) \quad k_t(T) = \frac{1}{\sin(\omega \cdot t)}$$

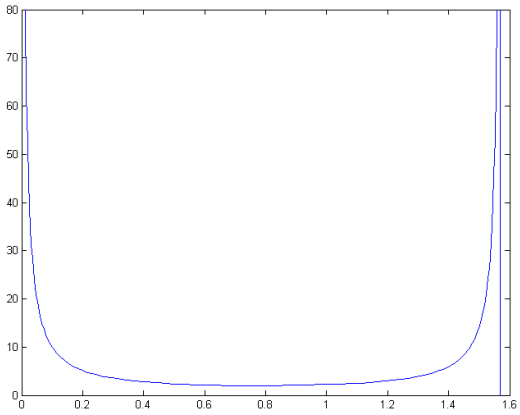

Fig.1.*Shape of $k_t(t)$.*

This identifies the behavior of the trigonometric function (41) and determines its value, which has a strong influence on the time constant value. This behavior is typical for trigonometric functions. Figure 1 shows a typical shape of the magnitude during one period T.

In accordance with the speed *c* of EMW spread, it is the product of this time constant and frequency, because the time delay happens at the beginning of each new excitation.

$$(43) \quad c = \tau \cdot f = \frac{0{,}07958}{f} \cdot k_t(t) \cdot f = 0{,}07958 \cdot k_t(t)$$

From this expression, it follows that $k_t(t)$ has a constant value, for the conditions by which the value of c is determined. Value of this constant is

$$(44) \quad k_t(t) \approx \frac{c}{0{,}07958} = 3{,}7672 \cdot 10^9$$

This value represents the reciprocal value of the corresponding sine whose argument is

$$(45) \quad \propto \approx arcsin \frac{1}{3{,}7672 \cdot 10^9} = 1{,}5209 \cdot 10^{-8} \quad [rad]$$

It defines the position of a working point on the sinusoidal curve within a span, 0 to 2π, regardless of the frequency or the value of the period T. The changing of $k_t(t)$ can not come earlier than would change the density of electrions in space throughout the spread of the waves. The enhancement of frequency f reduces its value, but increases within the same ratio as the number of cycles that commenced with the beginning of the time delay, and as a result, stays the same. The constant value of the speed of EMW spread within the vacuum is a logical consequence of this ratio. I am free to assume that this circumstance is one more argument that speaks in favor of the suggested NMN model on which these analyses are founded.

2. COMMENT ON THE RESULTS RECEIVED.

The analysis operates on the sub-elemental level as well as with elektrions as carriers of electromagnetic processes. Substantially it is founded on the experimental determination of magnitudes based on applied classical principles of electrodynamics. The procedure is relatively simple because it includes only one type of physical particles. Outside the sub-elemental level, the structures become more complex and represent composite particles whose composition is by components with various characteristics. In order to identify some components of these structures we must form a corresponding experimental database, which will characterize these particles.

In the first part was given a formal analysis of processes in the course of one period by any frequency using a sinusoidal function $h(t)$ whose dimensions correspond to some power (2). Its integration during period T gives the relation between its effective and maximal values within an observable period. This relation shows that function h(T) doesn't change its value with size T, or with the frequency, which states Planck postulate about the nature of the constant that he had determined experimentally. Proof is mathematical but begs the question: "Is it possible to find a physical explanation for this posture?" The explanation depends on a physically model with this and the validity of one model is determined by its ability to explain it. I will try doing it with the NMN model.

EMT as process, acts on a sub-elemental level with carriers whose characteristics are as follows:

- Elektrion as carrier of processes has a constant characteristic, which is independent of the time and space coordinates.
- If it is supposed that the distribution of electrions is uniform within space during long periods, then other parts of the system, react identically to the disturbance of one election.
- Size of this reaction depends on the dynamic character of the disturbance that arises.
- All disturbances are electrodynamic in nature and act according to the corresponding electrodynamic laws.
- Electrodynamic disturbance of the elektrions can be provoked only by particles or their aggregate with electrical charges or other EMW (which by this model is the same). the

size of this charge is quantized and can be only one member of a discrete order. On the sub-elemental level, first are all the movable elektrions (regardless of the way these electrions can move) and/or EMW which are the consequence of some disturbance in other localities.

- By its movement, every initiator of a disturbance passes by pozels and negels distributed along their paths within space, and on this path lose a part of their own kinetic energy, and the level of disturbance energy will fall alongside its trajectory as the does the frequency of the excited particles. Some of these particles can already be within excited states. In this case there comes a superposition of their disturbances. A consequence fo superposition can be their multi-frequent oscillation, which in terms of visible EMW result ins frequency spectra that our sensors register as spectra color.
- Appreciation of these particularities represents the fundamentals of the previous analysis. In the first part is obtained the correlation between energy of EMW and noncyclical movement electrions. Those correlations have sense only in the case of synchronous accordance with integer value periods EMT and some values of the electrions speed (when square root integer values of speed are even integer values of frequency EMT). This accordance has sense only through EMT because it allows explanation of appearance and the spreading of processes assigned as electromagnetic waves. Nevertheless, short-lived, non-cyclical movement of pozels or negels is the essence of the creation and spreading of EMW.
- Between those two processes, cyclical and non-cyclical, there are serious variances within the character of energy shift and concomitant appearance, especially when they are connected to another observation level. Wave processes are characterized as very tempestuous energetic transformations that happen cyclically over time. The matter is of the type, potential $\leftrightarrow$ kinetic energy. By non-cyclical processes all happen more subdued and separate from dynamics, especially when the disturbance source isn't some function of time or its momentum changes slowly.
- Within the second part, we combine the time and characteristics of these two methods to describe energetic processes on a sub-elemental level. We find the fundamental properties of the particle carrier of those processes - electrions. Values of sub-elemental electrical charge and dimensions of space filled with these charges are found. These data mean the revision completes our presentation about the composition of subatomic, atomic and molecular structures. Limit of indivisibility is shifted many order of magnitudes to the arena of micro particles. Part of the revision is within references, but remaining are many things for which analysis is needed to create corresponding physical and mathematical models.
- Third part gives another picture of the mechanism for the spread of EMW and the magnitude of the speed of EMW or the speed of light, c. The basis for this analysis is discussed within the first two parts and on the experimentally determined value of c. The movable particles that have this speed in their oscillations in one locality and their electromagnetic inertia cause time delays in the spread of energetic disturbances, which happened at this locality. This magnitude changes solely if there is a change of density in the processes.

3. CONCLUZIONS.

The model of EMW is founded upon elektrions as carriers of the physical process. This enables reinstalling a physical base to the explanation processes, their excitation, spreading and acting on the material structures which they find within the radius of their influence. The characteristics of this model are:

1. EMW doesn't arise by directed motion but by oscillations in the motion of electrions of both polarity.
2. Electrions, as carriers of electromagnetic processes, are uniformly distributed within universal space during long time periods. Prima facie, they represent a system with determined characteristics that makes it possible to spread EMW within space[3].
3. Planck's constant and speed of EMT are unique fundamental sub-elemental magnitudes whose values are experimentally determined. Other magnitudes that characterize EMT behavior by different conditions have a different character.
4. Utilization of the NMN model, the fundamental physical laws and foregoing experimental data was determine as follows
   - The value of a sub-elemental electrical charge which posesses electrions is $6{,}9892 \cdot 10^{-39} \quad [C]$
   - Radius of elektrion's space filled with this charge is $2{,}4674 \cdot 10^{-51} \quad [m]$.
5. Magnitude c, which is defined as the speed of EMT, represents a time delay in the spread of electromagnetic disturbances across space, within a time unit. The consequence is an electromagnetic reaction of a system of elektrions in a state of change within the universe. This time delay has physical grounds and depends on the electrions' density within space throughout which the disturbance is spread.
6. Utilization of these speeds as limitation magnitudes in the movement of material structures does not have a physical grounding, which questions the fundamental posture of the theory relativity.
7. Speed of electrions oscillatory motion can significantly surpasses the value *c*.
8. The results of this analysis infers the need to seriously reassess existing theories within physics.

3. REFERENCES.

- L1.Miloš Abadžić: Concerning Nature - Part 1: Appearance and Processes [PDF]. Serbian text only; The General Science Journal: Added May 10.2007
- L2.Miloš Abadžić: Naturalistic Model of Nature [PDF]. The General Science Journal: Added May 21.2007
- L3.Miloš Abadžić: Creating Sub-Atomic Structures by the NMN Model. The General Science Journal: Added Sept. 8.2007

[3] This conclusion reestablish within advisement one physical milieu which is formerly denominative ether, but just now it is with quit determine properties. As its name I use beyond old term *ether*.