Exploration

Derivation of Natural Constants with a New Formula: Part III

Halit Eroglu[*]

Abstract

In this series of articles, the theory of a new formula is presented with which it is possible to derive fundamental constants of nature. This theory is a further development of Max Planck's approach to the quantized values. It elegantly combines different phenomena of the microcosm and macrocosm in a plausible explanation. With the new formula the following fundamental constants and significant physical parameters were derived: speed of light, elementary charge, electron mass, gravitational constant, fine structure constant, acceleration of gravity, classical electron radius, proton mass, quantized mass and several modified Planck-units. No original Planck units and their numerical values were used in this article. However, in honor of Max Planck, I have named after him the new quantized sizes. The Planck mass, the Planck length, etc. should therefore not to be confused with the original Planck units.

Part III contains the following: 4. Space and Time; & 5. Time Factor.

Key Words: natural constants, new formula, microcosm, macrocosm, speed of light, elementary charge, electron mass, gravitational constant, fine structure constant, proton mass, Planck.

4. Space and time

In the previous chapters we have determined quantized sizes, the modified Planck units with the new world model, and with the help of these have derived experimentally measured quantities such as the proton mass and the gravitational constant with equations. They were lead back to the quantized sizes with $\sqrt{10}$ and the speed of light. In this chapter, we will now analyze these two fundamental elements of the universe.

4.1. The origin of time

When defining the time as the period between two events, then the time, or more specifically, a certain timing cycle, is the actual cause of the events. Without time, physical processes cannot take place, because there would be no "pulse", which could be addressed by the events. The events in the smallest dimensions do namely not take place itself, while time is running alongside, but it is the quantized timing cycle, which causes the events with its cycle sequence.

---
[*] Correspondence: Halit Eroglu, Independent Researcher, Frankfurt, Germany. E-Mail: info@hc10.eu

Prespacetime Journal| April 2013 | Volume 4 | Issue 4 | pp. 458-473
Eroglu, H., *Derivation of Natural Constants with a New Formula: Part III*

459

All physical processes depend on a universal timing cycle, whose sum we measure as an ordinary time, describe it as a Time Arrow and on which also the Cause-effect principle is based.

Each dynamic element, which provides movement in the space, and thus causes events, therefore also contains a universal timing cycle. Also any kind of force and momentum transfer contains this timing cycle and we've already seen it in the derivation of the acceleration of gravity, the gravitational constant, and finally in the speed of light.

The time occurs in the smallest dimension and develops into the higher dimensions through the summation. Our seconds on a macroscopic scale, is the sum of the quantized timing cycles in the Planck dimension. In the Planck sphere there's plenty of time for the quantum events.

The measured time is therefore dependent on the size scale, and this principle can also be transferred to the macrocosm. While on earth millions of years pass according to our time measurement, for an observer in the quantity of several million light-years only some seconds would pass according to his clock.

If an even larger observer would consider the entire universe in the size of a marble, then a ray of light needs several billion years on the way to us in our time measuring, for the great observer only last some fractions of a second according to his time measurement.

As we have seen in the derivation of the speed of light, the motion of the light in space depends on a certain time cycle. The first term in the equation for the speed of light also contains a time factor as an impulse generator:

$$t_C = \frac{10}{9,99} = 1,0010010010\ 0....$$
(4-1)

This term for the time cycle can also be written as follows:

$$t_C = \frac{\left(\dfrac{\sqrt{10}}{3}\right)^2}{1,11} = 1,0010010010\ 0....$$
(4-2)

By rearranging we get:

$$\left(\frac{\sqrt{10}}{3}\right)^2 = 1,00100100\ ...\cdot 1,11 = 1,1111\ ...$$
(4-3)

The interaction of the space balls in the three-dimensional space (left side of the equation 4-3) is equal to the quantized timing cycle by a factor of 1.11.

Prespacetime Journal| April 2013 | Volume 4 | Issue 4 | pp. 458-473
Eroglu, H., *Derivation of Natural Constants with a New Formula: Part III*

460

With further transformations we get:

$$\sqrt{10} = 3 \cdot \sqrt{1,00100100 \, ... \cdot 1,11}$$
(4-4)

$$\sqrt{10} = \sqrt{1,00100100 \, ... \cdot 1,11 \cdot 3^2}$$
(4-5)

From this equation, we again obtain without root terms the original equation (4-1) for the universal timing cycle with $t_C = \dfrac{10}{3^2 \cdot 1,11} = \dfrac{10}{9,99} = 1,0010010010\ 0....$, which is also contained in the speed of light.

The energy in the space balls in the form of attractive force with the value of $\sqrt{10}$ consists of three-dimensionality of the space with 3^2 and the universal Space-Time-Quantum with 1.11, which finally brings into fore the quantized timing cycle with $1.00100100100....$

The origin of time is thus associated with the emergence of the three-dimensionality of space, which we will now discuss in the next section.

4.2.   The origin of spatial dimensions

We live in a three dimensional world, and also the space balls on which our physical world are based on, are three-dimensional. But how does the three-dimensionality of space occur?

In the previous Chapters we have discussed the interactions between space balls and have derived various correlations. To analyze the structure of time and the three-dimensionality of space, now let's look more closely at the space balls.
Geometrically, a point has only one dimension. Several adjacent points at one level provide a surface with two dimensions. Several areas stacked finally create a three dimensional space. The geometric dimensionality is thus based on the addition of points in space.

According to the equation (4-5), the three dimensions of the quantized space are created from the last Chapter by the following relation:

$$\sqrt{10} = \sqrt{1,0010010010\ 0... \cdot 1,11 \cdot 3^2}$$

with the factor 3^2, i.e. from the square of our familiar three dimensions.

We describe the three-dimensional space in a general coordinate system with three spatial axes. But with the emergence of the three dimensions by the space balls, from the center there are formed squared spatial axes. In the picture below left, they are shown with dashed and solid

Prespacetime Journal| April 2013 | Volume 4 | Issue 4 | pp. 458-473
Eroglu, H., *Derivation of Natural Constants with a New Formula: Part III*

461

lines. Apparently, negative numbers and zero, on which our three-dimensional coordinate system is based, does not exist in nature.
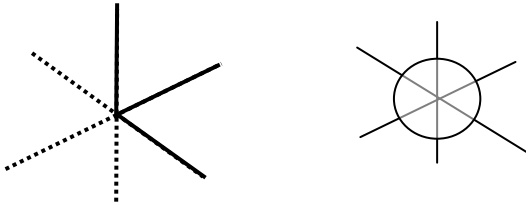
The origin of time is associated with the formation of the three-dimensionality of the space. The energy in the space balls is spread spherical in the room at its formation with the dimension factor of 3^2 (picture above right).

This process does not occur suddenly, but after a certain predetermined quantized unit of 1.11. The universal timing cycle with 1.001001001 ... describes how the energy during the formation of dimension in units of 1.11 is distributed in the three-dimensional space balls.

$$\frac{1{,}111111 \ldots}{1{,}11} = 1{,}0010010010\ 0\ldots$$

The product of 1.11 x 1.00100100100 ... = 1.11111 ... results in an infinite magical, transcendent number, which represents the infinity of time and energy.

The factor 1.11 ensures the distribution of infinite energy 1.1111.... in the space balls according to the same portions, and it accordingly creates the universal timing cycle. This factor of 1.11 is a universal **Space-Time-Quantum** and has an absolute magnitude as the fundamental importance. The other fundamental constants of nature, like the speed of light or Planck's quantum of action are merely the products of this space-time-quantum.

Outside the space balls it is possible to explain the physical world with the basic elements of the speed of light, Planck's quantum of action and the energy in the space balls. But as we have seen now, these basic elements arise from the universal timing cycle in the formation of dimension to the space-time quantum 1.11 in accordance universal formula (without l_P):

$$\hbar \cdot c = \sqrt{10} = \sqrt{1{,}0010010010\ 0\ldots \cdot 1{,}11 \cdot 3^2}$$

The origin of everything in the universe, and thus the space and the time is connected to the three-dimensionality of space. The summation of quantum events, and the quantized timing cycle over several size scales finally brings forth our physical, three-dimensional world.

In the universe there are only three observable space dimensions. The black holes are proof for this. Three-dimensional space is in fact destroyed by them and converted into its original shape. Without these black holes it would be otherwise possible to assume that our three- dimensional world transfers on greater length scales in additional spatial dimensions.

With the speed of light, we are able to explain the universe very well, because, in addition to the space as length unit it also contains the universal timing cycle as a dynamic component. The speed of light contains indeed the universal timing scale in a certain form, as we have seen it in the derivation of the speed of light.

The grand unified theory is based on the universal timing cycle, which is included in the speed of light. With the new formula $\hbar \cdot c = \sqrt{10} \cdot l_P$ we have derived the fundamental quantized elements with which the universe is structured, and they all contain the speed of light as a time factor. The speed of light is the ubiquitous parameter in the equations, and therefore we can describe the overall dynamics of the universe with it (without Planck length):

Quantized energy: $E_P = \hbar \cdot c$

Quantized charge: $Q_P = \dfrac{\hbar \cdot c}{\pi^2}$

Quantized Mass: $m_P = \dfrac{\hbar}{c}$

The attraction in the space balls follows like any other power, the universal timing cycle. The $\hbar$ and c are not the cause of the attraction force in the space balls, but they are formed in the dimension formation with the universal space-time-quantum.

It exceeds our imagination to try to explain the contents of the space balls. They are made of energy, but what does this energy look like?

The space balls are not like solids, such as Metal balls, nor do they consist of some fields. The energy is neither solid nor liquid, most likely it is similar to a gas cloud. Gases consist of tiny atoms and the energy cloud in the space balls consists of one element that exceeds our imagination. The contents of the space balls, so the energy in its original form will keep us busy for a long time.

Even the space with its three dimensions as a medium in which there is the primordial energy exceeds our imagination and with our analogies and logic we can only explain it approximately. But we know that the space and energy are present, just as we know that we do exist. Being is no illusion, but when we try to describe it, we make our human imagination illusions

Prespacetime Journal| April 2013 | Volume 4 | Issue 4 | pp. 458-473
Eroglu, H., *Derivation of Natural Constants with a New Formula: Part III*

463

To understand the reality and to approach the absolute truth has always been a desire for knowledge of mankind. As long as we are aware of our limited mental capacities, we can avoid fatal illusions and develop ourselves culturally.

We have called the energy in the space balls as an elementary force, which shows itself in the form of attraction. The consequences and the relationships of the attraction force have been explained in the previous Chapters. But it is not possible to physically or philosophically explain; why this attraction exists and shapes our physical world.

4.3.   The origin of π

For centuries, people are thinking about the mysterious circle number π. Meanwhile, the computer calculations reach with billion decimal places and in this way it is tried to bleed the secret of this numerical value.

The number π is inter alia defined as the circumference of a circle with the diameter of one.

$$\pi = \frac{Circumference}{Diameter}$$

With the circle diameter of 1 it results $\pi = Circumference$.

The circle number e.g. gives the route of which is covered in a circle when you are connected to the center circle with a rope. The value of π is obtained from a certain attraction force to the center of the circle.

Without this attraction, the value of π would not have the known value. If for example you connected to the circle center with a rubber rope, you will not obtain the value of π for the circumference of a circle. The elementary principle of attraction in the universe gives the circle number π the value it has. Without this elementary principle this π-value would not exist and there would also be no balls, atoms, planets, stars, galaxies etc. The attraction force as elemental force; shapes the entire universe, and it is reflected in the circle number π.

With the new formula it is possible to physically explain the energy and their distribution in the three-dimensional space balls, but in this process also the circular number π is formed, which is necessary for the space geometry. The circle number π is important for the construction of the universe and its numerical value is based on similar principles, as described in the previous Chapters.

The circle number π is a "natural constant" of mathematics and geometry, and we will analyze its origin. Since nature does not make calculations itself nor looks up the π-value from a table, the circle number π must be a product of a particular physical process.
 There are different mathematical methods of approximation for π, but we want to analyze the physical process and not mathematically derive the π value.

Prespacetime Journal| April 2013 | Volume 4 | Issue 4 | pp. 458-473
Eroglu, H., *Derivation of Natural Constants with a New Formula: Part III*

464

In a famous mathematical problem known as the "Basel problem" because it were first especially Basel mathematician who dealt with it, the question was whether or not the sum of the reciprocal squares do converge and against which value. The great mathematician Leonhard Euler finally delivered with the solution with:

$$\sum_{n=1}^{\infty} \frac{1}{1^2} + \frac{1}{2^2} + \frac{1}{3^2} + \dots + \frac{1}{n^2} = \frac{\pi^2}{6}$$

Through this conversion formula we obtain:

$$\pi^2 = 6 \cdot \sum_{n=1}^{\infty} \frac{1}{1^2} + \frac{1}{2^2} + \frac{1}{3^2} + \dots + \frac{1}{n^2}$$

The circle number π consists of the sum of the reciprocal square numbers each in six space axes and this formula of Euler describes very well the formation of π.

This result is obtained also with the spherical geometry. The space balls have a diameter of l_P, and for the surface area of the space balls we obtain without powers of ten:

$$O_P = 4 \cdot \pi \cdot \left(\frac{1}{2} l_P\right)^2 = \pi \cdot l_P^2 = \pi$$

and the volume of space balls is:

$$V_P = \frac{4}{3} \cdot \pi \cdot \left(\frac{1}{2} l_P\right)^3 = \frac{\pi}{6} \cdot l_P^3 = \frac{\pi}{6}$$

The product of volume and surface area of the space balls gives the limit value of the reciprocal square numbers derived by Euler:

$$V_P \cdot O_P = \frac{\pi}{6} \cdot \pi = \frac{\pi^2}{6}$$

The three-dimensional space develops in this geometric approach as the product of volume and surface area. Several superimposed areas geometrically result in a three-dimensional body. The contents of the space balls as an spherically symmetric body, physically describes the new formula, and the geometrical structure is described by the circular constant π. During the physical origin of the three-dimensional space balls the circle number π is formed too, but it is not the number π that brings forth the three-dimensionality, but it is a product of a physical process. The space-time quantum, which we discussed in the last Chapter, describes the physical process leading to the three-dimensionality of space, and π describes the resulting geometric component.

Prespacetime Journal| April 2013 | Volume 4 | Issue 4 | pp. 458-473
Eroglu, H., *Derivation of Natural Constants with a New Formula: Part III*

465

The universe is electromagnetically structured and all physical phenomena are caused by the interactions of the charge. The quantized charge therefore contains the energy and the circle number π in the following form:

$$Q_p = \frac{\sqrt{10}}{\pi^2}$$

The physical constants of nature are the result of the fundamental, physical relations, and the circle number π occurs as a result of three-dimensionality. The circle number therefore is the result of a physical process, and not the cause, just like the speed of light and the Planck quantum of action are not the cause of the new formula, but their product.

Since antiquity, it is philosophized about the order and harmony in nature. Whether or not this order is based on mathematical principles, all things consist of numbers or emerge, have also always been subject to philosophical debates.

At the new formula and the circular constant π it can be seen that the numbers are not the cause but merely the result of physical processes. With mathematical formalism it is tried to represent reality but therefore, reality actually must exist initially. I.e. without real existing balls there is no π, and without real existing bodies, there are no numbers to count the bodies.

4.4.   The origin of the relativistic effect

At high speeds and in the vicinity of gravity it comes to relativistic effects, which are described in the theory of relativity and calculated with the Lorentz transformation.

Lorentz factor:

$$k = \sqrt{1 - \left(\frac{v}{c}\right)^2} \qquad (4\text{-}6)$$

The Lorentz transformation is based on space geometry and the constant of speed of light. The theory of relativity is based on the constancy of the speed of light, and according to this theory, there is no absolute space. In the general theory of relativity it is even explained the gravity as a geometric property of space.

We will not discuss this comprehensive theory in individual items and will only explain the relativistic effects with the new world model in this Chapter.

Prespacetime Journal| April 2013 | Volume 4 | Issue 4 | pp. 458-473
Eroglu, H., *Derivation of Natural Constants with a New Formula: Part III*

466

The new world model is based on the world's absolute space, and the first signs of Max Planck, to create a basis for the base units with quantized sizes, was implemented with the new world model.

As we have seen in the previous Chapters, the universe is composed of space, time and energy and, if you look at it from a different perspective is built up in an unprecedented form.

According to the new world model, dynamic physical processes depend directly on the time, or more precisely on the universal timing cycle. The time is thus not a neutral measure magnitude that is measured outside the process, but it makes additions itself for the sequence of events according to a determined timing cycle. Besides space, time is also a fundamental quantity. This could be recognized quiet well in the derivation of the speed of light at the beginning of this Chapter. How much space points the light passes during its movement in space is namely defined by a timing cycle.
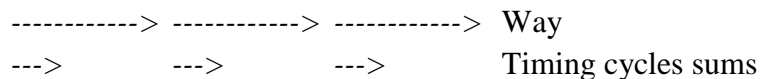
The origin of the relativistic effects is based on the three-dimensional absolute space and universal timing cycle. The theory of relativity also shows that space and time are very similar. Relativistic effects are directly caused by quantized timing cycle which occurring at high speeds, and which are also included in the gravitational constant.

In the new world model the relativistic effects are based on absolute space and time or here, the proper time is variable. Speeds are movements in space, and therefore in absolute space, time is variable.
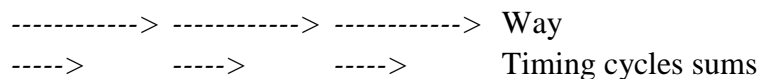
$$Speed = \frac{Way}{Time}$$

Since the space and therefore the route is an absolute quantity, the relativistic effects occur at high speeds, because the change of the relations between distance and time only occurs through the proper time variable, which consists of quantized timing cycles.

high speed:
------------> ------------> ------------> Way
--->   --->   --->   Timing cycles sums

low speed:
------------> ------------> ------------> Way
----->   ----->   ----->   Timing cycles sums

As you can see from this diagram, the space is absolute, and thus the distance is constant. However, depending on the speed the sum of the quantized timing scales do change, that are shown in the picture with different arrow lengths.

Prespacetime Journal| April 2013 | Volume 4 | Issue 4 | pp. 458-473
Eroglu, H., *Derivation of Natural Constants with a New Formula: Part III*

467

The relativistic effects are a consequence of the quantized time cycles, the sum of which results in the measured proper time. Thus, at every event, anywhere in the space there is its own quantized time as proper time. Therefore, we can measure other time sums in the rest frame as in the moving system. Moving clocks run slower, because the "per quantized timing cycles" become lower. Since each physical process can occur by a timing scale, and a movement in space is a physical process, the relationship between distance and time changes at high speed, wherein the path is constant and the proper time is variable.

The speed in this case indicates the events in the absolute space rate of the "per quantized timing cycle". Based on the speed we get to know how much quantized events may take place according to the universal timing cycle. At high speeds, for each section of the space there is less quantized timing scale and the upper speed limit for physical processes is normally the speed of light.

The speed of light determines the possible per quantized timing scale interactions between the space balls. We have seen in the relationship of charge interactions and the speed of light in the derivation of the speed of light. The light travels in a vacuum exactly with the possible highest interaction rate and in accordance to the quantized timing cycle. In other media (water, glass, etc.) it has a lower speed, because the interactions slow down the light with the medium.

The time for events measured by us is the sum of the quantized timing cycles, and with our watches we measure the total stroke. Since a moving clock has a speed, and the speed is the ratio between the distance and time, at high speed at an absolute way, this ratio only changes by changing the sum of the timing cycle. And the less time cycles for physical processes are available, the fewer processes can take place.

The measured time as the sum of the timing cycles is a smaller value at high speeds, and accordingly, moving clocks run slower, because the sum of the individual constant timing cycles becomes smaller. This situation is referred to as time dilation, and it can be better described with the variable proper time than the curved space with the absolute time of the speed of light and variable.

As we discussed in the Chapter in the derivation of the gravitational constant, the gravity of the relation between mass and charge is created by a specific timing cycle. Relativistic effects caused by gravity are due to interactions with charges after the universal timing cycle. The gravitational constant contains, as well as any other force that triggers dynamic processes, the universal time factor. By this time factor, the clocks on towers go faster than on Earth's surface. Time dilation has thus directly influence on gravitation.

In direction to the center of gravity of the earth increases, the gravitational force increases, but the quantized timing cycle in the gravitational interaction between the mass and charges decreases in the direction of the center of gravity, and fewer processes per timing cycle take place. I.e. the greater the gravitation, the higher the influence of the time dilation. This effect will

Prespacetime Journal| April 2013 | Volume 4 | Issue 4 | pp. 458-473
Eroglu, H., *Derivation of Natural Constants with a New Formula: Part III*

468

be less influent on the earth than for larger masses and the special celestial objects like black holes.

The relativistic mass is strictly speaking, the effects of time dilation on the mass, because the mass is on the time factor in the speed of light through the relation $E = m \cdot c^2$.

The relativistic effects at high speeds, such as the length contraction and relativistic mass increase, are results of varying proper time, and thus a consequence of the time dilation. By high speeds, the proper time, as the sum of the quantized timing cycles is less, because space is absolute. Thus, all relativistic effects in absolute space are caused by universal timing cycle and are based on time dilation. The relativistic effects are basically time effects. Therefore, in measurements of the quantized timing cycle as sums as proper times we obtain different values at high speeds and under gravitational influence.

5. Time Factor

In this chapter we will deal with issues that we previously have not discussed for better understanding so far. Before that, we had to learn some principles for us to deal with further details.

5.1. The Planck time

As we have seen in our previous analyzes of the time, it is impossible to define the Planck time. Although the quantized timing cycle with the speed of light is included in every quantized size, the Planck time does not exist in the usual form. There is only the quantized timing cycle and this universal timing cycle produces the events, which we can measure. However, the events take place according to various sums of quantized timing cycles. Therefore there is no absolute time for all events at any location, but each event has its own timing cycle-sum. This issue with the proper time we have discuss in the last Chapter on the analysis of the relativistic effects.

The international definition of the macroscopic second is based on the speed of light, but we cannot use the second for the definition of the quantized time, because itself depends on the quantized timing cycle in the speed of light

The second is the sum of the quantized timing cycles, which we have established as the unit of measurement of the constant time rate in a microscopic event:
"One second is 9,192,631,770 times the period length of the transition between the two hyperfine structure levels of the ground state of the atoms of the radiation corresponding to Cesium isotope 133Cs. "

Prespacetime Journal| April 2013 | Volume 4 | Issue 4 | pp. 458-473
Eroglu, H., *Derivation of Natural Constants with a New Formula: Part III*

469

It is reasonable that the universe is not governed by our definition of time. As we have seen in the last Chapters, the universe has its own time structure. Therefore, instead of the Planck time as a microscopic second with a quantized magnitude, we can define the Planck- timing cycle with the value 1.00100100100... as an infinite series, which is based on each physical event.

5.2.   The universal validity of the new formula

The new formula ought to contain the universal space-time quantum and the universal timing cycle, which we discussed in the previous Chapters. They would then look like this:

$$Space\text{-}time \quad quantum = \frac{\left(\frac{\sqrt{10}}{3}\right)^2}{1,00100100\,...} = 1,11 \tag{5-1}$$

Or as a description of the energy in the space balls:

$$E = \sqrt{10} = \sqrt{1,0010010010\ 0...\cdot 1,11\cdot 3^2} \tag{5-2}$$

But I have chosen the form of $\hbar \cdot c = \sqrt{10} \cdot l_P$, because it contains the well-known physical constants with c and $\hbar$.

A grand unified theory has universal validity, and therefore it consists of the number one. If there are extraterrestrial highly developed civilizations, which certainly have a different numbering system and other definitions of length and time, the universal formula is valid also with them in the above form.

The speed of light c and the smallest effect ℏ have the value we know because of our earthly determinations of length and time units. The meter is based on the circumference of the earth and our second on the orbital period of the Earth around the sun, so our earthly years. These measurement units have been clarified in the international determination and now are based on the speed of light.

If other civilizations in the universe, for example inhabit a planet twice as big as our Earth, and attribute their unit length on the perimeter of their planet, they would obtain a different numerical value for the speed of light with their years as a unit of time duration. Thus they would have a different value for the Planck constant, because this constant depends on the definition of the speed of light. Thus, the quantized variables, the so-called modified Planck units, are "earthly sizes" because they depend on the definition of the speed of light with our measurement units.

Prespacetime Journal| April 2013 | Volume 4 | Issue 4 | pp. 458-473
Eroglu, H., *Derivation of Natural Constants with a New Formula: Part III*

470

The numerical values of the fundamental constants of nature on the left side of the new formula depend on the length and time definition of individual civilizations; the right side of the new formula, however, is universally valid. In other words: the physics that we operate is "earthy" because it is based on earthy measurement units, and only through transformation with the new formula it can attain universal validity. Each civilization can make physics with its numbering system and its measurement units. But in the entire universe, all physical phenomena are ultimately attributed to the new formula.

The famous physicist Max Planck, in answer to the discovery of the quantum of action, has found the importance of this natural constant, but he could not have guessed that it is only the product of the universal new formula. He defined the Planck units and the following quote gives an indication of the priority given by Planck admitted to these units:
"... ... retain necessary their significance for all times and for all, also aliens and nonhuman cultures and which therefore can be described as natural Mass units."

Under their number system, another civilization would receive another numerical value, but the components of the formula with the world timing cycle 1.00100100... and the space-time quantum 1,11 are universal valid because they are based on the number 1. Not the number 10 is the foundation of the new formula, but the timing cycle and the space-time quantum, because each number system is based on the number one.

If we were ever to communicate with a highly developed alien civilization, these universal elements of the new formula would form the basis for this. Certainly other cultures have a different numbering system and other characters for the numbers. But the number one is universal and therefore also forms the basis of the new formula.

5.3.   The time factor in the natural constants

In the derivation of the natural constants in the previous Chapters we have described the coefficients in the formulas as a "time factor". The laws of nature explain the relations and interrelationships of physical phenomena based on sizes, and with the time factor, we can explain the dynamics behind these physical processes. According to the new world model, each dynamic element ensuring movement in the space and thus causing events; contains a universal timing cycle. Also any type of power transmission includes this timing cycle, and we will discuss this topic in this Chapter.

Based on the derived formula for the speed of the light, the nature of time has been explained with the universal timing cycle in the last Chapter. Therefore, we will discuss the time factor for the other derived constants of nature.

Prespacetime Journal| April 2013 | Volume 4 | Issue 4 | pp. 458-473
Eroglu, H., *Derivation of Natural Constants with a New Formula: Part III*

471

The time factor in the acceleration of gravity

The time factor in the acceleration of gravity, as we have seen in chapter 3.6 is as the following:

$$t_g = \frac{3,33333\ldots}{6,06060\ldots} = \frac{3}{6} \cdot \frac{1,111111\ldots}{1,010101\ldots} = \frac{0,1}{0,181818\ldots} = 0,55$$

This time factor is connected to the time factor of the gravitational constant, and therefore we will consider both together.

The time factor in the gravitational constant

For the gravitational constant we had obtained the following time factor in the derivation:

$$t_G = 3\frac{1}{3} = 3 \cdot 1,11111\ldots = 0,55 \cdot 6 \cdot 1,010101\ldots = 0,55 \cdot 6,060606\ldots$$

The time factor in the gravitational constant includes the time factor of the acceleration of gravity of 5.5. While the acceleration of gravity depends only on the mass density of the attractive celestial body and has a relatively small range; the force of gravity depends on the mass densities of two bodies and it has an enormous reach.

The different range s-is caused by the factor 6.060606... . At acceleration of gravity it is divided by this factor and at gravitation, it is multiplied with it. In other words: For acceleration of gravity, the time factor is directed inward to the center of the attracting celestial body, and it therefore has a limited range. In contrast, it is directed outwardly at the gravitation, whereby the attraction force attains an enormous range.
The quantized timing cycle is included in the two variables by the value of 1.0101010.... Further analyzes were not performed, but the difference to the universal timing cycle of 1.00100100 ... apparently is based on the interaction between two bodies.

The timing cycle 1.00100100100... was defined as "universal timing cycle", because the speed of light is the most important physical constant in the universe. Other time cycles, such as discussed above, are modified forms of this universal time cycle.

The unilateral impulse transmission in the space at the speed of light contains the universal timing cycle 1.00100100100... with the space-time quantum 1.11. The bilateral interaction with the gravitational acceleration and gravitation contains the timing cycle 1.01010101010... with the space-time quantum 1.10. The difference results from the space-time quantum and it is reduced with bilateral interaction.

The laws in this effect have yet to be studied. Apparently, this difference of the timing cycle is based on physical properties at the pulse and power transmission. These two physical effects are

Prespacetime Journal| April 2013 | Volume 4 | Issue 4 | pp. 458-473
Eroglu, H., *Derivation of Natural Constants with a New Formula: Part III*

472

caused by different time cycles. The time in the units of the physical variables makes clearly the difference.

$$[g] = \frac{[m]}{[s^2]} \qquad [G] = \frac{[m^3]}{[kg] \cdot [s^2]} \qquad [impuls] = \frac{[m \cdot kg]}{[s]}$$

The time factor in the fine structure constant

In the fine structure constant, the time factor is not explicitly included in the formula. But with the grand unified theory beside the derivation of this fundamental constant, it also can e derived the underlying time factor. The basic principle of the fine structure constant is actually based on the following relationship with the universal time cycle:

$$t_\alpha = \frac{(1,11111\ldots)^2}{1,00100100\ldots \cdot \frac{9}{10}} = 1,3703703703\ 7\ldots \qquad (5\text{-}3)$$

This is also equivalent to:

$$t_\alpha = (1,111111\ldots)^2 \cdot 1,11 = 1,3703703703\ 7\ldots \qquad (5\text{-}4)$$

The numerical value of this fundamental constant results from the overlaying of this time factor with the interactions taking place, which are described with the fine structure constant.

Summary of results so far

The new formula, in terms of the natural constants tells us principles of dynamics which were previously unknown. Previously, the physical constants only could be determined by measurement, and it was not known what they are attributed to. As we have seen in the derivations of these fundamental constants, in addition to the quantized values also the time factor is responsible for the dynamics of the natural constants.

The time factor in the constants of nature determines how the pulse, and the power is diverted in quantized form. Not only the physical parameters such as mass, charge, etc., are quantized, but also the time. This fact is logically comprehensible when it is considers that the time cannot run continuously when the quantities involved are quantized. The interactions between the quantized sizes take place in accordance to the quantized timing cycle.

Prespacetime Journal| April 2013 | Volume 4 | Issue 4 | pp. 458-473
Eroglu, H., *Derivation of Natural Constants with a New Formula: Part III*

473

As we have seen in the derivation of the speed of light, in the analysis of time and now also in the analysis of time factors in the constant of nature, the time is not a neutral measure which is measured outside the process, but it makes provision for the sequence of events according to a determined cycle. In addition to the fundamental Planck magnitudes, the time is responsible for the dynamics of the universe.

The functioning of the time can be explained physically approximately from these aspects. The possibility of quantizing the world has far reaching impact on our world view. With the new formula, we can attribute anything to the quantized elementary elements, namely space, time and energy.