System of electron-proton. Movement, rotation, pulsation and Gravity Forces

Valentina Markova

Bulgarian Academy of Sciences, Sofia, Bulgaria

*****Corresponding author**
Dr. Valentina Markova, Bulgarian Academy of Sciences, Sofia, Bulgaria.

Abstract
The new Field Theory consist two new Axioms and eight new Laws. It has been proposed and developed in previous reports by the same author. This report uses two axioms and six laws only. According to the first axiom (Axiom1), the author replaces uniform motion in a closed circle with non-uniform motion in an open vortex. According to the second axiom (Axiom2), it exists a pairs of vortices that are mutually orthogonal or they work in a system of resonance. The most probable of all of variants is the following pair: accelerating vortex from the center outwards connected with a decelerating vortex from the periphery inwards. This case is a model of the connected proton-electron pair. In this report the properties of a system only of linked electrons and protons are studied. It is known that the Electromagnetic Field propagates at a constant speed and the waves are only transverse. According to the new Axioms and Laws in the electron-proton system, the internal connections are of variable speed and the waves are not only transverse but and longitudinal. It appears that the interactions between the proton and the electron are not Electromagnetic. They include cross vortex with variable velocity and longitudinal vortex with variable velocity as well.

From previous developments it is clear that the electron is not a concentric open vortex but an eccentric open vortex, centered in the second quadrant. And the proton is not a concentric open vortex but an eccentric open vortex, centered in the first quadrant. This is the reason for the formation of eccentricity vectors that decompose along the x and y axes.

Because the eccentricity of the electron is greater than the eccentricity of the proton then the component along the y axis rotates the electron around the proton (in orbit). And besides, since the decelerating vortex of the electron emits elementary decelerating vortices (Law 5) inward which are bent in the direction of the decelerating velocity, the electron will rotate parasitically and slowly around its own axis (in spin).

The electron and proton are repelled gravitationally by a transverse component and are attracted gravitationally by a longitudinal component which are with variable speed. The existence of feedback between the electron and the proton (Law 7 and Law 8) explains the reason for the presence of elementary cross vortices. When they are emitted outward - are called "free energy". And because they are invisible -are called and "black matter" as well.

1. What is known so far?
According of the Classic Axiom of Maxell's Laws Electromagnetic Field is evenly field that is spreading only in constant velocity [1, 2]. According to the new Axiom (Axiom1) it exists another kind of unevenly field that is spreading in variable velocity and something more - it can be crosswise and longwise as well [3, 4].

Eccentricity of Electron
The structure of an electron is well known from previous reports of the same this author.
According to the new Axiom1 is assumed that the structure of an electron is an open vortex and the electron is not concentric but it is eccentric vortex [5, 6].

According to the Consequence of Law1 is obtained that the structure of an electron is a decelerating open vortex directed from outside to inside as it was described in detail this process [7].

Axiom 1. The motion of vector with monotone-decreasing or monotone-increasing velocity becomes along an open vortex: div (VotE) ≠ 0 for vector E in 2D or div (VotH) ≠ 0 for vector H in 3D.
Therefore: div (rot E) ≠ 0, or div (Vor E) ≠ 0, where the motion of the vectors E in 2D, or H in 3D with monotonically- accelerated or monotonically - decelerated motion occurs in the form of an open vortex (Vor), in which:

div (Vor E)> 0 or div (Vor E) <0 in 2D,   **1a.**
div (Vor H)> 0 or div (Vor H) <0 for 3D.   **1b.**

Law 1: The open cross vortex (E_{2D}) generates (inward or outward) an open longitudinal vortex (H_{3D}) (inward or outward) in its center through a cross-longitudinal transformation Δ1:

$$\Delta 1$$
$$\text{Vor } (E_{2D}) => - \text{Vor } (H_{3D}), \qquad\qquad 2.$$

where Vor (for Vortex, meaning an unevenly vortex) replaces rot (for rotor, meaning opened loop); the cross vortex in 2D (E_{2D}) continues its development in 3D as a longitudinal vortex (H_{3D}) in perpendicular direction.

Remark: The mechanism of action of the delta1 operator (Δ1) contains all variations of full resonance [3,4]. Full resonance is resonance in amplitude, frequency and phase, i.e. resonance in space and time. It will be described in detail in the following articles.

Consequence: The open decelerating cross vortex (E_{2D}-) generates inward an open accelerating longitudinal vortex (H_{3D} +) outward. This action takes place from the center of decelerating cross vortex (E_{2D}-) through a particular cross-longitudinal transformation (Δ1-). Therefore, the *decelerating cross* vortex in 2D (1), (E_{2D} -) continues its development in 3D as an accelerating longitudinal vortex (2), (H_{3D} +) in perpendicular direction (Figure1b).

$$\Delta 1\text{-}$$
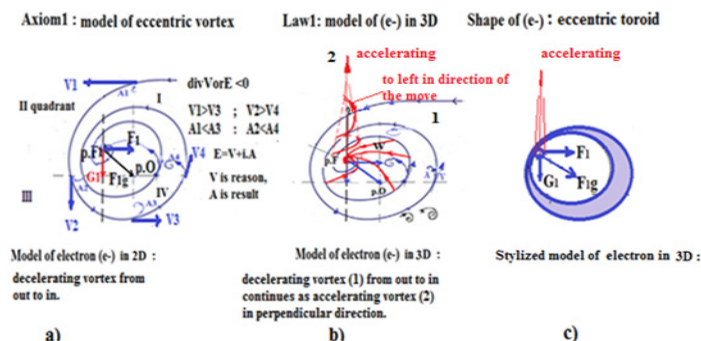$$\text{Vor } (E_{2D}\text{-}) => -\text{Vor } (H_{3D+}). \qquad\qquad 3.$$

Remark: The direction of the accelerating longitudinal vortex (to the left in the direction of movement Figure 1b) *completely coincides with the direction according to Law 6.*

Because of that, the velocity vector (V) decreases continuously when it moves from the outside inwards, *the whole spiral shifts towards the second (II) quadrant.* The center of classic spiral was in the geometric center (p. O). But the new center of the decelerating spiral (p. F_1) shifts to up and left or to the second (II) quadrant. That is why the distance between the classic geometric center (p.O) and the new center of gravity (p. F_1) forms a vector of eccentricity or Vector of Gravity (F_1g) (Figure 1a).

The reason for eccentricity of electron is that the vector of velocity V_1 is longer than vector of velocity V_3 (in opposite point of spiral) and the spiral will move to the bigger vector V_1 or will move to up. At the same time, because of continuously decreasing of velocity, the vector of velocity V_2 is bigger than the vector of velocity V_4 (in opposite point of spiral) and the spiral will move to the bigger vector V_2 or will move to left:
$$V_1 > V_3, V_2 > V_4.$$

Figure 1: Model of electron(e-)
Result: As a result the whole spiral will move to up and left si-

multaneously or will move to the second (II) quadrant (Figure 1a).

Result: The Vector of Gravity (F_1g) exists as an inner force that *attracts and tightens the coils* of the vortex to an inner point (p.F_1) which is different to the geometric center (p.O).

Result: Because of that the Vector of Gravity is F_1g, it is decomposed to x-axis and to y-axis.

The composite vector on the x-axis is a vector F_1. In previous report the role of this vector (F_1) was described in detail. In this report it will be describe the composite vector on the y-axis which is a vector G_1 (Figure1a, c).

Eccentricity of Proton
According to the Axiom 2 the proton should be an orthogonal to the electron particle because both of them form a complementary pair (Figure2) [3, 4].

Axiom 2. Two vortices of one complementary pair in mode of resonance to one direction in 2D: E =+A+iV; E=+V+iA or two vortices of complementary pair in mode of resonance to opposite direction in 2D: E = -A - iV; E = -V – iA, exist simultaneously in 3D.
In right direction: E =+A+iV; E=+V+iA,　　　4a.
In left direction: E = -A - iV; E = -V – iA.　　　4b.

Definition: A pair of objects which work as they complement each other in resonance and they are mutual orthogonal is called pair of complementary objects [5, 6] .

According to Axiom 2 if one object pushes (p+) (E =+A+iV) (Figure 3b) but other have to pulls (e-) (E=+V+iA) (Figure 3a). Therefore the both of them are active generators or they form a pair of active generators in complementary resonance work.

Result: The first pair is in right direction: amplitude (A) can be the reason but the velocity (V) is the result (E = +A + iV) (Figure 3b) (model of proton). At the same time the velocity (V) can be the reason and the amplitude (A) is the result (E =+ V + iA) (model of electron) (Figure 3a) .

Remark: In this report does not describe the second pair in opposite direction: E = -A – iV, (model of antiproton) and E = - V – iA (model of positron).

Law 2: The open longitudinal vortex (H3D) generates (inward or outward) an open cross vortex (E2D) (inward or outward) in its center through a longitudinal-cross transformation Δ2:
$$\Delta 2$$
$$\text{Vor } (H_{3D}) => - \text{Vor } (E_{2D}) \qquad\qquad 5.$$

Consequence: The open *decelerating longitudinal vortex* (H_{3D}-) generates inward an open accelerating cross vortex(E_{2D+}) outward through longitudinal-cross transformation Δ2-:
$$\Delta 2\text{-}$$
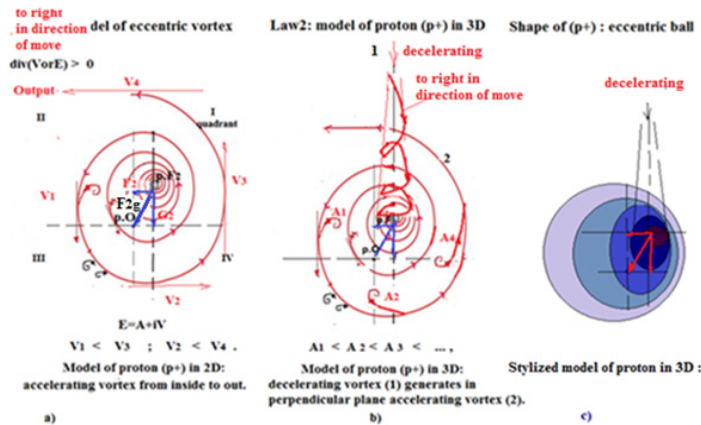$$\text{Vor } (H_{3D}\text{-}) => -\text{Vor } (E_{2D+}). \qquad\qquad 6.$$

According to the Consequence of Law 2 the proton's structure should be an accelerating vortex from inside to outside (Figure 2a), [7].

Remark: The mechanism of action of the delta2 operator ($\Delta 2$) contains all variations of so called "*Back wave*". It will be described in detail in the following articles.

Because of that the velocity vector (V) increases continuously when complex vector (E) moves from the inside outwards (E=A+i.V), the whole accelerating spiral shifts toward the first (I) quadrant. The center of classic spiral was in the geometric center (p. O). But the new center of the accelerating spiral (p.F) shifts to up and right or to the first (I) quadrant. That is way the distance between the classic geometric center (p.O) and the new center of gravity (p. F_2) forms a vector of eccentricity or Vector of Gravity (F_2g) (Figure 2a).

Figure 2: Model of proton (p+)

The reason for eccentricity of proton is that vector of velocity V_1 is less than vector velocity V_3 in opposite point of spiral and the spiral will move to the bigger vector V_1 or will move to right. At the same time, because of continuously increasing of velocity, the vector of velocity V_2 is less than the vector of velocity V_4 in opposite point of spiral and the spiral will move to the bigger vector V_2 or will move to up (Figure 2a): $V_1 < V_3, V_2 < V_4.$

Remark: The direction of the decelerating longitudinal vortex (1) is from up to down and rotate to the right in the direction of movement (Figure 2b) This direction *completely coincides with the direction according to Law 5*.

Result: As a result, the whole spiral will move to right and up simultaneously or will move to *the first* (I) quadrant (Figure 2a).

Result: The Vector of Gravity (F_2g) exists as an inner force that *inflate and expand (as with a mixer)* the coils of the accelerating vortex to an inner point (p. F_2) that does not coincide with the geometric center (p.O) (Figure 2a).

Result: The Vector of Gravity is F_1g is decomposed to x-axis and to y-axis (Figure 2a).

In this report it will be describe the composite vector on the y- axis only, which is a vector G_2 . The composite vector on the x-axis is a vector F_2. In previous report the role of this vector (F_2) was described in detail (Figure 2a).

The Reason for Eccentricity of Electron

According to the Law1 electron consists of decelerating cross vortex rolled from outside to in. To Law1 there is additional information from a new Law 5 which explains the reason for eccentricity of electron. The reason for eccentricity of electron is that the main open decelerating vortex of electron emits decelerating elementary vortices to environment to inside towards the center of electron toroid.

Law 5: The velocity (V) of a decelerating longitudinal vortex decreases in (n) portions $(1/ \psi)^n$ times, while the amplitude (W) of cross vortices increases reciprocally in (n) portions $(\psi)^n$ times:

$$I \ V^2 = V_0 \ (V_0 - V), \hspace{3cm} 7a.$$
$$I \ W^2 = W_0 (W_0 + W), \hspace{3cm} 7b.$$

where vn and wn are periodic roots with period n that fulfill the requirement for orthogonality: $v_n.w_n = V_0.W_0$; $n = 0 \div \infty$; the roots vn and ωn are expressed as: $v_n = \psi_n.V_0$, $w_n = (1/\psi)^n.W_0$; V_0 is the starting value of V_n ; W_0 is the starting value of wn and ψ is a proportion which fulfills the requirement: $\psi - 1/ \psi = 1$ and it is called golden proportion.

Result: Decelerating vortex of electron emits *elementary cross vortices* from periphery to center inward (and from periphery to environment outward as well) because of sign (+) in second equation (7b).

Result: The elementary cross vortices which are emitted from periphery to the center *are phased at the Gravitational center* (p. F_1) in the second quadrant (II) (Figure 1b).

Result: According the Consequence of Law1 (3) as a result of the phasing in the Gravitational center (p. F_1) a *vertical acceleration vortex is generated*. Therefore, decelerating cross vortex *continues* in accelerating longitudinal vortex, *perpendicular* to the plane of the cross vortex. This process of transformation is described by the operator $\Delta 1$ of Law1(4) (Figure 1b).

The Reason of Eccentricity of Proton

According to the Law 2 proton consists of accelerating cross vortex rolled from inside to out.
There is new Law (Law 6) which describe that accelerating vortex sucks accelerating elementary vortices from environment.

Law 6: The velocity (V) of an accelerating longitudinal vortex increases in (n) portions $(\psi)^n$ times ,while the amplitude (W) of cross vortices decreases reciprocally in (n) portions $(1/ \psi)^n$ times;

$$I \ V^2 = V_0 \ (V_0 + V), \hspace{3cm} 8a.$$
$$I \ W^2 = W_0 (W_0 - W), \hspace{3cm} 8b.$$

where vn and wn are periodic roots with period n that fulfill the requirement for orthogonality: $v_n.w_n = V_0.W_0$; $n = 0 \div \infty$; the roots vn and ωn are expressed as: $v_n = \psi_n.V_0$, $w_n = (1/\psi)^n.W_0$; V_0 is the starting value of V_n, W_0 is the starting value of wn and ψ is a number which fulfills the requirement: $\psi - 1/ \psi = 1$, ψ and it is called golden proportion.

Result: Accelerating vortex of proton sucks elementary cross vortices because of sign (-) in second equation (8b).

Result: According the Law2 (6) vertical decelerating vortex *generates accelerating* cross vortex from Gravitational center (p. F_2) to periphery. Therefore, decelerating longitudinal vortex, which is perpendicular to the plane of the transverse vortex, continues into accelerating cross vortex. This process of transformation is described by the operator Δ2 of Law2 (6), (Figure 2b).
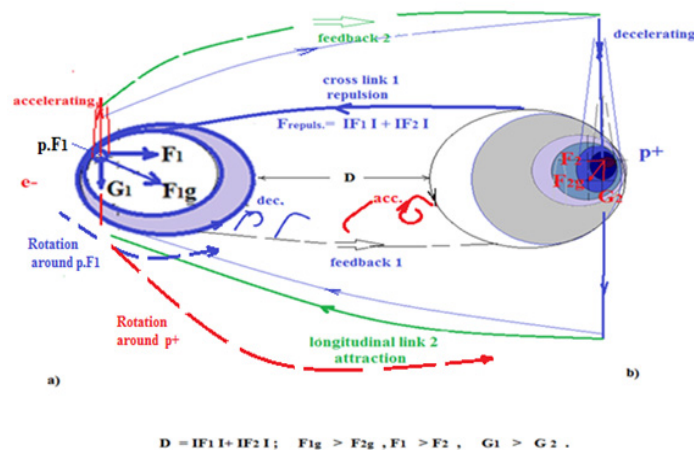
2. The Essence of System of Electron - Proton
Closed loop through the cross vortices in 2D: System is formed through cross vortices in plane 2D (Law7) and longitudinal vortices in volume 3D (Law8).

Law 7: A pair of open cross objects in 2D forms a closed loop in 2D by feedback in 2D of primary cross vortices.
Law 7 describes close loop in plane 2D of pair proton-electron : 1÷feedback1 (Figure3).

This pair *conducts energy* through the real connection (1) and *conducts matter* through a feedback (feedback1) in 2D (Figure 3).

$$D = IF_1 I + IF_2 I; \quad F_{1g} > F_{2g}, F_1 > F_2, \quad G_1 > G_2.$$

Figure 3: Gravity Forces, Rotation of electron around the proton and around its own center.

Result: The pair proton-electron in 2D conducts energy from proton to electron through the real connection (1) and *conduct matter from electron to proton* through a feedback (feedback1) in the form of primary elementary cross vortices (decelerating and accelerating) (Figure 3). This real part of the chain in 2D is invisible and unexplored part.

Result: Exactly the primary elementary cross vortices represent transferred so called "dark" matter that called "free" energy as well. This imaginary part of the chain in 2D is invisible and unexplored part as well.

The reason for the emission of primary elementary cross vortices is the deceleration (dec.) of the main longitudinal vortex of electron (e-) (Figure 3a) . Their movement to the space between the two vortex objects in 2D is due to the sucking action of the accelerating (acc.) main longitudinal vortex of proton vortex (p+) (Figure 3b) .

Closed loop through the longitudinal vortices in 3D:
Law 8: A pair of open complex objects in 3D forms a closed

loop in 3D by feedback in 3D of primary longitudinal vortices.
Law 8 describes close loop in volume 3D of pair proton-electron: 2÷feedback2 (Figure3)
This pair *conducts energy* through the real connection (3) and *conducts matter* through a feedback (feedback 2), (Figure 3).

Result: The pair proton-electron in 3D conducts energy from proton to electron and conduct matter from electron to proton in form of *primary elementary longitudinal vortices.*

Result: The primary elementary longitudinal vortices represent transferred so called "dark" matter is not in cross kind of vortices but in longitudinal kind of vortices. This part of the chain in 3D is the most mystical, invisible and unexplored part.

Result: It is well realized that the chain (1÷feedback1) of Law7 and the chain (2÷feedback2) of Law 8, are mutual perpendicular (Figure 3).

3. Gravity Forces of Repulsion and Attraction Between Electron and Proton (Figure 3).
According to the Axiom1 and Axiom2 the relationships between electron and proton are measured by the distance (D) between them and by the repulsive force (F_{repuls}). between them.

Result: In the first pair of complementary objects electron-proton which are linked in the frame of atom, the distance (D) between objects is equal to summation of modules of their forces along x-axes (Figure3a, b).

Result: The Force of repulsion (F_{repuls}) between electron and proton is equal to the summation of modules of their forces along x-axes (Figure3a, b).

According the Law1 and Law2 we can realize the differences between Force of repulsion (F_{repuls}). and the Force of attraction ($F_{attract.}$). among the electron and the proton.

Result: The proton repulses electron through cross *waves* (cross link 1) by repulsion of the transverse waves.
Result: The proton attracts electron through longitudinal *vortices* (longitudinal link 2) by tightening of longitudinal threads of perpendicular coils.

4. Score of Electron-Proton System
The Shape: The shape of electron looks like to thin ring or narrow toroid. The reason is decelerating vortex of electron from out to in. She shapes of proton looks like to dense little ball. The reason is accelerating vortex of proton from in to out (Figure3).

The mass of "free" electron
The mass of electron is much less (as thin ring, Figure 6a) than the mass of proton (as dense ball, Figure 6b). The current measurement method shows that:
m (electron)= $9,11 \times 10^{-31}$ kg ; m(proton) =$1,6726231 \times 10^{-27}$ kg.

$$m_{P_+} = 1836 . m_{e-} \qquad\qquad 7.$$

All inner electrons have a smaller mass than the free electron. So the mass of little ball of proton is much more (1836 times) than the mass of empty toroid of electron.

The Eccentricity
The eccentricity of the electron (F_1g) (in form of empty ring) is much more than eccentricity of proton (F_2g) (in form of dense ball) (Figure3a, b):

$$F_1g > F_2g. \qquad 8.$$

Therefore: $F_1 > F_2$.

The Distance
The Distance between electron and proton is following (Figure3):

$$D= I\,F_1\,I + I\,F_2\,I \qquad 9.$$

The Force of Repulsing
According to the Figure3 it is realized that:

$$F_{repuls.} = I\,F_1\,I + IF_2\,I. \qquad 10.$$

The proton repulses your personal electron. This is done through link (1) (Figure 3a, b). The accelerating longitudinal vortex from the proton *presses the delay coil from the most peripheral coil of electron (1)* and repulses the electron from the proton.

The cross vortex of connection (1) is not an Electromagnetic connection. It is well known that Electromagnetic waves propagate transversely and at a constant speed only. But the cross vortex of connection 1 propagates longitudinally at the acceleration-deceleration speed.

This elastic *link in 2D (1) of longitudinal vortex* with variable velocity is the same example for Gravity Force of Repulsing in the cross direction (Figure 3a, b).

The Force of Attraction
The longitudinal vortex from the proton that passes *through center of electron (2) attracts the electron to the proton.*

This *elastic, bent-arched link in 3D (2) of longitudinal vortex* with variable velocity is the other example for Gravity Force of Attraction in perpendicular direction (Figure 3a, b).

Electron and Proton Temperature
We saw that the electron consists of a decelerating vortex in direction from outside to inside. Due to the friction in the medium, the decelerating vortex emits to inward elementary decelerating vortices and raise the temperature in the empty space of the electron toroid.

Result: Therefore, inside the toroid of the electron, *the temperature rises* or the electron is hot *inside* (Figure 1b).

We saw that the proton consists of an accelerating vortex with a direction from inside to outside. Due to the positive acceleration this vortex sucks elementary accelerating vortices, which reduce and lower the temperature inside the ball of proton (Figure 2b).

Result: Therefore, inside the ball of the proton *the temperature decreases* or the proton is *cold inside* (Figure 2b).

Visible or invisible
Sunlight is transverse waves propagating at a constant speed. When these transverse waves cross the thread of the longitudinal vortex, they are not reflected but surround the thread. The reason for this action is the fact that the thread diameter of the longitudinal vortex is commensurate with the wavelength of sunlight. This phenomenon is known as *diffraction.*

Consequence: The *longitudinal vortices are invisible* to an outside observer because they do not reflect sunlight but scatter or diffract it.

Result: The *transverse connection (cross link1)* between the proton and the electron is a kind of longitudinal vortex and it is invisible. The proton transfers energy to the outermost transverse winding of the electron in the form of a twisted longitudinal vortex (Figure 3a, b).

Result: The *longitudinal connection is invisible as well (longitudinal link 2)* between the proton and the electron. The proton transfers energy to the center of the electron, and the electron sucks it from its center in a perpendicular direction (Figure 3a, b).

Result: The *feedbacks (feedback of cross link1 and feedback of longitudinal link 2)* are also invisible due to the fact that the elementary primary transverse and longitudinal vortices are commensurate with the wavelength of sunlight (Figure 3a, b).

Consequence: The *cross vortices are visible* to an outside observer because they reflect sunlight and they don't diffract it. An outside observer can see only cross vortex objects.

Result: *The proton and the electron are visible* (Figure 3a, b).

5. Two Modes of Pulsation
According to the Law1 and Law5 there are two phases in pulsation Mode of cross vortex of the electron [7].

Pulsation in Space:
In the Start Mode of pulsation:
Consequence: The electron becomes swollen and bloated, it becomes massive and with maximum radius.
The reason for this phenomenon is that the *proton-master transfers of more energy through cross link1* (Figure 3a, b). At the same time, according to the sign minus (-) in Law1 (2), when cross vortex becomes longer and bigger, the longitudinal vortex shrink's perpendicular to the plane of the electron.

Result: This electron becomes *clearly visible.*
Result: The longitudinal vortex is always invisible.
Result: The electron can locate itself at a long distance or at outer orbit.
Result: The electron can break cross connection (cross link1, Figure 3a, b) and can fly out of the atom or to *become a" free" electron.* This electron is controlled exclusively by the chain of the longitudinal component (longitudinal link2, Figure 3a, b) in any point in the space.

Obviously in the electron this very bloated cross vortex with maximum radius is visible. The shortest longitudinal vortex is invisible because it diffracts the sunlight but not reflects it.

In the Final Mode of Pulsation:
Consequence: The electron shrinks and becomes with minimum radius.

The reason for this phenomena is that the proton-master sucks *energy through cross link1* (Figure 3a, b). At the same time, according to the sign minus (-) in Law1 (2), when cross vortex shrinks, the longitudinal vortex becomes longer, perpendicular to the plane of the electron or the proton-master transfers a longitudinal vortex perpendicular to the electron. Therefore, the electron becomes contracted in a cross vortex with minimum radius and becomes very stretched with long and strong longitudinal vortex.

Result: The electron as shrunk cross vortex becomes invisible. Obviously when in the electron this very contracted cross vortex with minimum radius is invisible, the longitudinal vortex is invisible as well.

Result: The longitudinal vortex is invisible as well.

Result: The electron can locate itself at a close distance to the its own proton-master or at internal orbit. This electron is controlled exclusively by the chain of the longitudinal component (longitudinal link 2, Figure 3a, b) by its proton-master.

Pulsation in time for Low Frequency only
According Law7 and Law8 the whole system electron-proton pulsates synchronously. This means that when proton shrinks its corresponding electron shrinks as well. And when proton inflates its corresponding electron inflates as well.

Result: Instead of rotation along circle the electron is rotating along the ellipse.

Result: In curved sections of ellipse the electron is inflated in Start Mode

Result: In straight parts of ellipse the electron is shrunk in Final mode.

The layer structure of atomic nucleus and Modes of pulsation:
The hypothesis of structure of atomic nucleus is very logical and very probable [8]. The author perceives it as a working hypothesis. Result: It states that protons are arranged in layers.

Consequence: In pulsation the proton becomes inflated massive, with maximum radius.

According to the Law 2 and sign minus (-) for proton, when longitudinal vortex of generation decreases, the cross vortex increases and radius increases to maximum. This means that this proton will be in big size (radius) and will be located in periphery layers as in Start Mode.

Result: The outermost layers are made up of the most inflated protons, corresponding to the most inflated electrons from the Start Mode.

Consequence: The proton shrinks, becomes with minimum radius.

According to the Law 2 and sign minus (-) for proton, when longitudinal vortex of generation increases, the cross vortex decreases and radius decreases to minimum. This means that this kind of proton will be located in *central layers* as in Final Mode.

Result: The *innermost layers* contain the most shrunken protons, corresponding to the most shrunken electrons from the Final Mode.

6. Rotation of electron around its own proton-master (p+) (orbit)
The reasons of rotation: According to descriptions in previous points:
The mass of "free" electron: The mass of proton is almost 2000 times more than the mass of electron [7].
The shape and Eccentricity of Proton: The proton consists of numerous coils of a slow accelerating vortex, very tightly coiled from the inside out. This is the reason the proton looks like a very dense but slightly eccentric ball. The eccentricity is small because there is simply *no free space inside* the ball. That is way eccentricity of proton (F_2g) is less than the eccentricity of electron (F_1g), [8].

The Shape and Eccentricity of Electron
The electron consists of several pieces of coils of a fast decelerating vortex coiled from the outside in. This is the reason the electron is a very empty and eccentric toroid.The eccentricity is significant because there is *many free space inside* the toroid where to shift the coils ,the eccentricity of electron(F_1g)is more than the eccentricity of proton (F_2g), [8].

The difference in eccentricity between proton and electron
Because of that : $F_1g > F_2g$ then : $F_1 > F_2$, (8).
Therefore from Figure 3 follows that the components of F_1g and F_2g along the y-axis are :
$$G_1 > G_2 . \qquad\qquad 11.$$

This means that the vector G_1 of electron is more than G_2 of proton as well .

Summary
The light and empty (7) but very eccentric (8) toroid of the electron will begin to orbit the heavy and dense (7) but slightly eccentric (8) ball of proton.

The reason is that the vector G_1 in periphery of atom is much more than the vector G_2 in center of atom. Or the bigger vector G_1 applied perpendicular to maximum radius has *bigger moment of shoulder* than the moment of shoulder of its proton-master (11).

The difference in mass, shape and eccentricity are the reason for rotating of electron around the proton.

Result: The empty and very eccentric electron *will begin to rotate around the dense and slightly eccentric proton.*

Pulsation of Electron in Time and in Space
In Time: In time of rotation around its proton the electron pulsates in *High and in Low Frequency* simultaneously. The Pulsation in High Frequency of the electron does not change its size, radius and mass. The Pulsation in Low Frequency of the electron *changes significantly* its size, radius and mass. The Pulsation in Low Frequency of the electron is commensurate with the time for a rotation around its own proton.

Result: When the electron pulsates in Low Frequency (commensurate with the time for a rotation around its own proton) this electron draws ellipse instead a circle.

This means that the electron expands in curve part (Start Mode) of ellipse and becomes visible and the electron shrinks *in straight part* of ellipse (*Final Mode)* and becomes invisible.

According to Law1 because of sign minus (-): when cross vortex increases and Potential Energy increases, but at the same time the longitudinal vortex decreases and Kinetic Energy decreases. That is the reason the velocity of Kinetic Energy along the curved part of ellipse to be a minimum.

Result: The electron *expands in curve part* (Start Mode) of ellipse, its velocity in rotation around its own proton-master *decreases to minimum and it becomes clearly visible.*

According to Law1 because of sign minus (-): when cross vortex decreases and Potential Energy decreases, but at the same time the longitudinal vortex increases and Kinetic Energy increases. That is the reason the velocity of Kinetic Energy along the straight part of ellipse to be a maximum.

Result: The electron shrinks in straight part of ellipse (Final Mode), its velocity in rotation around its own proton-master *increases to maximum and it becomes invisible.*

In Space: If for some reason the electron expands (Start Mode) it jump to the farthest orbit. When the electron shrinks (Final Mode) it jump to closest orbit.

According to Law1 because of sign minus (-): when cross vortex increases (radius of electron increases) and Potential Energy increases as well. But at the same time the Kinetic Energy decreases and longitudinal vortex decreases.

That is the reason and the velocity around its Gravity Center and the Potential Energy (radius of electron) to *be a maximum* (Start Mode) but velocity around its own proton and the Kinetic Energy to *be a minimum.*

Result: When the electron expands (Start Mode) *it jumps to the farthest orbit,* its size and radius (mass) increases to maximum but its velocity in rotation around its own proton-master decreases to minimum.

According to Law1 because of sign minus (-): when cross vortex (radius of electron) decreases and Potential Energy decreases as well. But at the same time the Kinetic Energy increases and the longitudinal vortex increases. That is the reason and velocity around its Gravity Center and the Potential Energy to be a minimum (Final Mode) *but velocity around its own proton-master and the Kinetic Energy to be a maximum*.

Result: When the electron shrinks (Final Mode) it *jumps to closest orbit,* its size and radius (mass) decreases to minimum but *its velocity in rotation around its own proton-master increases to maximum.*

7. Rotation of electron around its own axis through Gravity Center (p. F_1) (spin)

The Reasons of Rotation Around Gravity Center
The Velocity of Electron Vortex Decreases
According to Law 5 decelerating vortex which winds electron decreases in velocity because of sign minus (-) in equation 7a.

The Amplitude of Decelerating Elementary Vortices Increases
According to Law 5 the decelerating vortex of electron *emits decelerating elementary vortices with increasing amplitude* because of sign plus (+) in equation 7b.

The Bending of Decelerating Elementary Vortices
According to Law5 the elementary vortices are bent, curved and convex *in the direction of motion of the main vortex of the electron*. The elementary vortices are directed from periphery of electron to the center where they are phased in Gravity center F_1 (Figure 1b).

The Whole Wheel of the Electron Rotates to The Left (spin)
The direction of moving of electron vortex is from *right to left and from periphery to center* (Figure 1). That is way the whole wheel of the electron rotates to the left as well.

Therefore, there are two reasons for the movement to left: 1) The main vortex of the electron rotates to the left from outside to inside.2) The wheel arm in the electron wheel are also curved to the left.

Remark: Left direction in 2D is when an independent observer *looks against the* longitudinal vortex in 3D.

Result: The electron will rotate around its own Gravity center (p. F_1) *with reduced speed*. This phenomenon is known as" spin" of electron.

The Pulsation Mode in Rotation Around the Gravity Center
As it is already known except rotation around its own proton-master and around its own Gravity center (p. F_1), the electron pulsates and has many pulsating states. These states of the electron are determined by the corresponding states of its own proton-master. The connection and command between them is described by Law 7 and Law 8. According to these Laws when the proton send energy to its electron, this electron jumps to more external orbit. When the proton suck energy from its electron, this electron jumps to more internal orbit. Therefore, the electron pulsates and has two extreme pulsating Modes: Start and Final Mode.

When Electron Is in Start Mode of Pulsation
This electron is inflated and has maximum *radius* and maximum length of the circle of empty toroid (Figure1c).
Because of that its proton-master send *maximum energy* and according to the Law1 this electron is located at the farthest orbit. Because of the *electron vortex has maximum length of the circle and* according to the Law5, the amplitudes of internal elementary cross vortices (quanta) increase and their acceleration also

increase. They *cause the wheel arm to rotate at a fastest speed* (Figure1b). This means that rotation of electron around its Gravity center (p. F_1) *becomes fastest.*

Result: The electron in Start Mode of *pulsation is located at the farthest orbits* because it is inflated and empty. It rotates around its own Gravity center (p. F_1) fastest.

As a comparison this electron rotates faster than the electron in innermost orbits and this electron rotates in much more speed than speed of its proton-master in nucleus of atom.

When the electron is in Final Mode of Pulsation

This electron is contracted and tight and its toroid has minimum radius and minimum length of the circle of empty toroid (Figure1c).

Because of that its proton-master *send minimum energy* and according to the Law1 this electron is located at the *closest orbit* to the nucleus of atom. The electron vortex has minimum length of the circle and according to the Law5, the amplitudes of internal elementary cross vortices (quanta) decrease and their acceleration also decrease. They cause the wheel arm to *rotate around Gravity Center at a slower speed* (Figure1b). The minimum velocity of the electron rotation around its Gravity Center strives towards the velocity of its proton-master in nucleus of atom.

Result: The electron in Final Mode of pulsation is rotates with *lowest speed around its* own Gravity Center and it is located at *closest orbit* because it is contracted and tight and its toroid has minimum radius.

As a comparison this electron rotates around its own Gravity center (p. F_1) in minimum speed at the closest orbits. It has minimum speed, equal to the speed of its own proton in atom nucleus.

Result: The minimum *speed of electron* in Final Mode of pulsation in rotation around its Gravity Center is speed of its own proton - both of them rotate synchronously.

When electron is subjected of external influence (Photoelectric Effect)

The launch of an electron towards an outer orbit can also be done by external action. For example, when an electron is bombarded with quantum of light in case of phenomenon *Photoelectric Effect*. According the Law 5 the decelerating electron vortex emits many elementary decelerating cross vortices (so called quanta) *towards inside* of the empty space of electron toroid (Figure1b).

When an electron is bombarded with quantum of light in case of phenomenon Photoelectric Effect, the electron sucks this quantum of light as *it corresponds to its own size or frequency*. Therefore, it can be assumed that the quantum of light is one decelerating elementary vortex which take part and build the inner space of electron toroid (Figure 1b).

Result: The essence of one quantum of light is a single decelerating elementary vortex identical as with which is emitted from decelerating main vortex of the electron towards

The essence of one *quantum of light* is a single decelerating elementary vortex identical as this which is emitted from decelerating main vortex of the electron and builds and opens the inner space of electron toroid. When this decelerating elementary vortex of light quanta enters into the inflated periphery electron (in case of Photoelectric Effect) this electron increases its own energy even more, inflates even more and fly out of atom.

Therefore, in the case of Photoelectric Effect, the electron sucks an identical outer light quantum, electron increases its own energy, inflates and passes into a more external orbit or takes off outside the atom.

Result: In the case of *Photoelectric Effect* the electron sucks the outer identical quantum of light, increases its own energy, inflates its toroid and passes into a more external orbit or takes off outside the atom.

When Electron Is Radiated by A Luminous Substance (Luminescence)

The jumping of an electron towards an inner orbit can occur by sucking its proton- master in nucleus of atom which creates the particularly *luminous substance*. As it is well known the luminous substance is the substance whose electrons emit towards environment their excess internal quanta as a quanta of light. If an electron jumps to inner orbit, its own energy decreases, its toroid shrinks to the smaller radius and it emits towards environment the excess internal quantum as elementary cross vortex.

Therefore, the reason for the suction of an electron towards an inner orbit is sucking from its own proton -master which take part in the nucleus of atom of the particularly luminous substance.

If the electron jumps between two adjacent orbits, a quantum of light will emit precisely defined color of light, corresponding to a frequency and the size of the excess quantum as the form of a decelerating elementary vortex.

Result: In a luminous substance if the electron jumps *between two adjacent orbits* toward inside, the electron emits towards environment one excess internal quantum as a quantum of light, shrinks its radius and size. It jumps from one higher energy state towards the adjacent lower energy state or from outer orbit towards adjacent inner orbit.

If the electron jumps between several orbits, several color-forming quanta will be emitted, corresponding to several frequencies and corresponding to several sizes of the excess internal quanta, which are emitted to environment in the form of decelerating elementary vortices.

Result: In luminous substance if the electron jumps from the outer to the inner orbit between several orbits, it emits different colors and intensities from light quanta, depending on the distance between energy levels of the orbits.

The Essence of Quantum Transitions

There are *many transient states between Start and Final Modes* of pulsation. The transition from orbit to orbit is expressed by the transition from one energy state to other energy state. This phe-

nomenon will be described and calculated in next reports.

The transition of electron from an inner orbit to an outer orbit and the its flying out of atom is expressed by a transition from a lower energy to a higher energy. This phenomenon is expressed by the suction of a quantum of light from outside (*Photoelectric effect*).

The transition of electron from an outer orbit to an inner orbit is expressed by the transition from higher energy state to lower energy state. This phenomenon is manifested and is expressed by the emission of a quantum of light in luminous substance (*Luminescence*).

Conclusions

- According to Axiom 1, the closed vortex is replaced by an open centric vortex. In fact, the evenly concentric vortex does not exist in nature .The evenly concentric vortex exists as unevenly eccentric vortex . Therefore, the concentric non-uniform vortex is in fact an eccentric non-uniform vortex.
- According to Axiom 2, the electron and the proton form a pair of complementary elements that work in resonance mode.
- Because of eccentricity the new Gravitational Center (p. F_1) of the electron is shifted relative to the Geometric Center (p.O) in the second (II) quadrant. Thus a Vector of Eccentricity (F_1g) is formed from the new Gravity Center (p. F_1) to the Geometric Center (p.O) and it decomposes along the x axis and along the y axis (Figure1a, b). The new Gravitational Center (p. F_2) of the proton is shifted relative to the Geometric Center (p.O) in the first (I) quadrant. Thus a Vector of Eccentricity (F_2g) is formed from the new Gravity Center (p.F_2) to the Geometric Center (p.O) in first quadrant (I) and it decomposes along the x axis and along the y axis (Figure2a, b).
- Due to the fact that the electron is manifested as a very empty and very thin toroid from a coiled decelerating vortex from outside to inside, the component on the y- axis of the electron is much larger than the component on the y-axis of the proton (Figure1b, c).
- In opposite, the proton is manifested as a very dense ball of coiled accelerating vortex from the inside out. Because of that here is not place, the y- axis is very small (Figure2b, c). This is the reason of the empty ring of the electron to revolve around the dense and large sphere of the proton (Figure 3).
- According to Law 5, the main decelerating vortex of the electron emits to the inner space of the electron many elementary decelerating vortices (quanta), bent in the direction of motion of the main decelerating vortex. This is the reason why the electron, in addition to moving around the proton, also and it makes a parasitic motion around its own axis (spin) around its new Gravitational Center (p. F_1).
- According to Law 7 there is Force of Repulsion from the proton to electron through cross vortex. It is not Electromagnetic Repulsing Force but it is special kind of cross accelerating-decelerating Gravity Force. According to Law 8 there is Force of Attraction from proton to electron through longitudinal

vortex. It is not an Electromagnetic Attracting Force as well, but it is special kind of longitudinal accelerating-decelerating Gravity Force.
- Except rotation around its own proton-master and around its own Gravity center (p. F_1) the electron pulsates and has two extreme pulsating Mode: Start and Final Mode. These two states of the electron are determined by the corresponding states of its own proton. The connection and command between them is described by Law 7 and Law 8.
- When the proton send energy to its electron, this electron will jump to a more external orbit or it will fly out of atom. In this state electron becomes the most bloated and most inflated with maximum radius (Start Mode of Pulsation).
- When the proton suck energy from its electron, this electron will jump to a more internal orbit. In this state the electron becomes the tightest and most shrunk with minimum radius (Final Mode of Pulsation).
- It exists many states between Start and Final Mode and transitions between them will be described further. When the electron expands (Start Mode) it jump to the farthest orbit, its velocity of rotation around its Gravity Center increases to maximum, but its velocity in rotation around its own proton-master decreases to minimum. When the electron shrinks (Final Mode) it jump to closest orbit, its velocity of rotation around its Gravity Center decreases to minimum, but its velocity in rotation around its own proton-master increases to maximum (Figure 3a, b).

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