



Cold Nuclear Fusion, Based on the Theory of New Axioms and Laws

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Abstract:

It is known that the Classical field theory is based on 1 basic Axiom set by Maxwell (1864) (Landau & Lifshitz, 1980). This basic Axiom describes a field with movement along a closed loop and with constant speed. It is an ideal foundation for describing an Electromagnetic Field, but it is not suitable for other more complex fields with variable speed and different accelerations. The author has proposed a more general Theory of Extended Field which consists of 2 Axioms and 8 Laws. New Axiom1 describes a structure of field

with movement along open loop or open vortex with variable speed. New Axiom2 describes two mutual orthogonal structures of fields which work in resonance. This new Theory leads to the following results: movement in a closed loop is replaced with movement in an open loop or vortex; evenly movement is replaced with unevenly movement (decelerated or accelerated); during its movement decelerating vortex emits primary free cross vortices, while accelerating vortices suck in of this same primary free cross vortices; movement in 2D is transformed into the movement in 3D; a transverse vortex in 2D generates a longitudinal vortex in 3D through a special transformation and vice versa - a longitudinal vortex in 3D through another special transformation generates the cross vortex in 2D (Markova, 2003; 2005; 2015). Now the author proposes to use a longitudinal accelerating vortex for cold fusion. With a force proportional to the positive acceleration, it will suck in both vortices and atoms - in this case the isotope of hydrogen (deuterium). The accelerator vortex sucks in and sticks two of all the deuterium, which will form helium in an exothermic reaction with the release of a lot of heat. A longitudinal acceleration vortex can be generated by applying Law 2. A decelerating transverse vortex in plane 2D (moving outside-inward) generates at its center a longitudinal accelerating vortex in 3D perpendicular to the 2D plane. This perpendicular accelerating vortex at the center pulls the transverse decelerating vortex up (against the Gravitational Force) or has quality of Anti-Gravity Force (Markova, 2018a; 2018b; 2020a).

Keywords: *Open vortices, Accelerating and decelerating vortices, Non-parametric processes, Gravity waves.*

Introduction

A Scientific News (Zyga, 2008)

“Physicists from Osaka University have demonstrated a cold fusion reaction. Scientists claim that they have managed to "make" two deuterium nuclei turn into a helium nucleus at room temperature, reports the electronic publication New Energy Times. A large amount of energy is released during the nuclear fusion

reaction. Until now, however, physicists could not carry out this reaction under the conditions of low temperature and pressure. Japanese physicists, led by Prof. Yoshiaki Arata, claim to have found a way to trigger the reaction without extreme conditions. The researchers brought the deuterium atoms close enough for the reaction to occur using an absorbent substance. The deuterium is fed into a "cell" containing a mixture of palladium and zirconium oxide.



According to Arata, this mixture absorbs a large amount of deuterium, as a result of which the individual atoms are brought together without the use of ultra-high pressure and temperature. The scientists claim that the proof of the reaction is the increase in the temperature in the cell after the release of deuterium. When Arata added the gas to the mixture of palladium and zirconia, the temperature rose to 70 degrees. According to the professor, nuclear and chemical reactions are taking place in the cell at that moment. After the gas supply was shut off, the interior temperature remained high for 50 hours.....” (Zyga, 2008).

A Clarification

A substance is usually used, for example, a mixture of palladium and zirconium oxide, called an absorber. It strongly absorbs a certain amount of deuterium atoms. Some of these atoms stick without using high pressure and temperature - they stick in the cold. They must form helium nuclei, during which a huge amount of energy is released in the form of heat. This approach of Prof Yoshiaki Arata from Osaka University is still hypothetical and because it is not clear whether the result is obtained from a nuclear reaction or rather - from a chemical reaction.

An Adaptation on base of the Theory of new Axiom and Laws (Markova 2022b; 2023)

The author proposes to imitate the situation of the Sun itself.

It can do it using the Theory of new Axioms and Laws invented from the same author. According to the Theory of new Axioms and Laws, the Sun is generated by an open vortex (Axiom1). And in more detail- a decelerating longitudinal tube or Funnel (from above - perpendicular downwards) in 3D creates an accelerating transverse vortex (from the inside – out) in 2D (Law 2). In the periphery on the Sun the positive acceleration of the transverse vortex becomes large enough. According to the attraction of this accelerating vortex in the periphery on the Sun (where the acceleration becomes large enough) some of the deuterium nuclei from the plasma are sucked in and stick in (Law 6). During this exothermic

reaction, helium nuclei are obtained, and a lot of heat is released.

According of that the Sun is generated by an accelerated (inside-out) open vortex it turns out that (Law 1) on the one hand its center is cold and it's the periphery becomes hot. And on the other hand (Law1) - the central core will rotate at a lower rate (angular speed) than the periphery of the Sun (who rotates at higher angular rate). This conclusion is inverse to the conclusion of the NASA SOHO (Solar and Heliospheric Observatory) mission (ESA's website for SOHO, 2003). Their conclusion is that the core of the Sun rotates at a faster rate than the outer zone.

The main reason for this reaction is a positive acceleration inside Sun. There is no such positive acceleration on Earth .The Earth is generated by decelerating vortices. That is why is that the Earth is generated orthogonally to the Sun. The reason is that the Sun and the Earth are mutual orthogonal bodies (Axiom 2). And in more detail the Sun send accelerating transverse vortex to Earth which, due to the great distance to planet Earth, becomes a decelerating vortex.

This decelerating vortex generates outside - inward a toroid as the body of Earth. It becomes as decelerating vortex emits from itself to the center decelerating primary vortices (Law 5). And besides in the center of toroid of Earth an accelerating vortex is shot perpendicularly upwards (Law1).

An Explanation According to New Axioms and Laws

A Classic Axiom

It is known that the Classic Field Theory is based by Maxwell's Laws (1864) and on a single Classic Axiom (Figure 1a) (Landau & Lifshitz, 1980).

It states that:

$$\text{div rot } E = 0 \quad (1)$$

The previous studies attempt to expand the Classic Field Theory to a more general Theory of Extended Field.

The author change this Classic Axiom .The new Axiom will state that the movement of a vector E in an open loop ($\text{div rot } E \neq 0$) or in an open vortex ($\text{div Vor } E \neq 0$) is unevenly (velocity is variable)(Figure 1b,c,e).

A New Axiom 1

Axiom 1: The motion of vector E with monotone-decreasing or monotone-increasing velocity becomes along an open vortex:

$$\begin{aligned} \text{div (Vor}E) \neq 0 \text{ for vector } E \text{ in 2D or } \text{div(Vor}H) \\ \neq 0 \text{ for vector } H \text{ in 3D} \end{aligned} \quad (2)$$

$$\begin{aligned} \text{div (Vor } E) > 0 \text{ or } \text{div (Vor } E) < 0 \text{ in 2D, } \text{div (Vor } H) > 0 \\ \text{or } \text{div (Vor } H) < 0 \text{ for 3D} \end{aligned}$$

The main result of Axiom 1 is that there have been 4 types of vortices: a cross vortex in 2D (E_{2D}) that can be accelerated ($E_{2D} +$) or decelerated ($E_{2D} -$) and a longitudinal vortex in 3D (H_{3D}) that can also be accelerated ($H_{3D} +$) or decelerated ($H_{3D} -$) (Markova, 2003; 2005) .

We are accustomed to the wrong image of a spiral with a constant distance between the turns (Figure1a). But it is “unreal” spiral. Because if it is a spiral, it must be opened and eccentric. If there is no opened, then it is not a spiral, but it is a closed loop The reason is in the acceleration (Figure 1b).

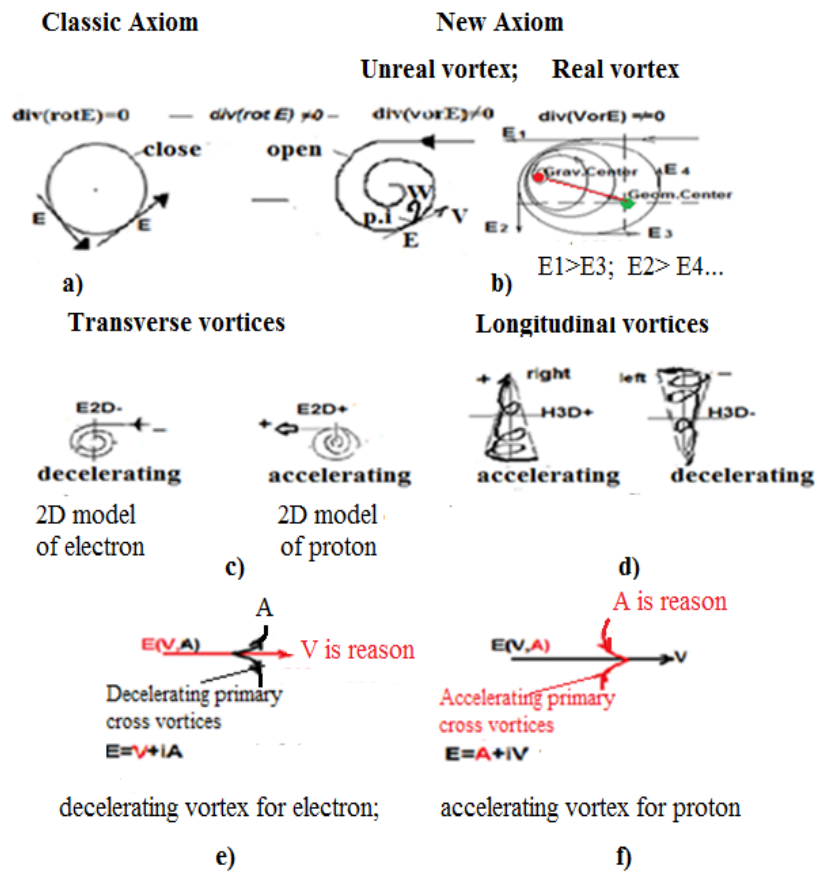


Figure 1. The Classical Axiom is Replaced by a New Axiom 1
Figure 1a). Classic Axiom as Closed Loop; Figure 1b). New Axiom as Opened Loop (vortex);
Figure 1c). Transverse Vortices (Decelerating and Accelerating);
Figure 1d). Longitudinal Vortices (Accelerating and Decelerating);
Figure 1e). Decelerating Main Vortex Emits Decelerating Primary Vortices (to out);
Figure 1f). Accelerating Main Vortex Sucks Accelerating Primary Vortices (to in).

Result: The open monotonically varying vortex is eccentric.

For example, in “real” decelerating vortex $E1 > E3$ and the Geometric Center will aim to move to the larger vector $E1$ (up). In the same vortex $E3 > E4$ and at the same time the Geometric Center will aim to move to the larger vector $E3$ (to the left). Therefore, the Geometric Center will move to a second quadrant or to the Gravity Center (Figure 1b) (Markova, 2005).

Result: There are two simultaneous movements in every point of open vortex

At every (i) point $p(i)$ of a decelerating cross vortex E there are two simultaneous movements: velocity vector ($-V$) and amplitude of the cross vortex ($-W$). The two simultaneous movements (V and W) also exist at all points of the vortex. The cross vortex (E_{2D} -) is transformed into a longitudinal vortex (H_{3D} +). This is accomplished through a specific operator ($\Delta 1$) for cross-longitudinal transformation (Figure 1c).

New Axiom 2

Axiom 2: Two vortices of one complementary pair in one direction in 2D:

$$E = +A + iV;$$

$E = +V + iA$, or two vortices of complementary pair in opposite direction in 2D:

$$E = -A - iV; E = -V - iA, \text{ exist simultaneously in the same time in 3D.}$$

Result: Two vortices (objects) in one system are not symmetrical but they are mutual orthogonal.

This means that if first generates transverse vortex as potential energy and consumes longitudinal vortex as kinetic energy (Figure 2b), the second –consumes transverse vortex as potential energy and generates longitudinal vortex as kinetic energy (Figure 2a) (Markova, 2005; 2015; 2019).

Result: Straight and inverse systems exist simultaneously

Example for elementary particles -in Figure 2 are described system proton (Figure 2b) electron (Figure 2a) and system antiproton (Figure 2d) and positron (Figure 2c) which exist simultaneously.

Example for Sun and planets: In Figure 2 are described system of third resonator inside Sun (corresponding to Earth) (Figure 2b) and third planet Earth (Figure 2a) and system of second resonator inside Sun (corresponding to Venus) (Figure 2d) and second planet Venus (Figure 2c).

Result: The system of third resonator inside Sun (corresponding to Earth) and third planet Earth exists simultaneously with the system of second resonator inside Sun (corresponding to Venus) and second planet Venus.

The planet system demonstrates existing of these two mutual inverse links of these mutual orthogonal objects. The planet system explains Axiom 2 more clearly than the system of elementary particles.

Law 1

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

$$\Delta 1 \\ \text{Vor} (E_{2D}) \Rightarrow \text{-- Vor} (H_{3D}), \quad (3).$$

where Vor (means an unevenly vortex) replaces rot (means a closed loop). The cross vortex in 2D (E_{2D}) continues its development in 3D as a longitudinal vortex (H_{3D}) (Figure 2a) (Markovs, 2015; 2019; 2020b).

Definitions:

A decelerating transverse (cross) vortex (E_{2D} -) is a cross open vortex (E_{2D}) for which $\text{div} (\text{Vor} E_{2D}) < 0$. A decelerating longitudinal vortex (H_{3D} -) is a longitudinal open vortex (H_{3D}) for which $\text{div} (\text{Vor} H_{3D}) < 0$. Figure 2b shows a decelerating longitudinal vortex (H_{3D} -) inward.

An accelerating transverse vortex (E_{2D+}) is a cross open vortex (E_{2D}) for which $\text{div}(\text{Vor } E_{2D}) > 0$.

An accelerating longitudinal vortex (H_{3D+}) is a longitudinal open vortex (H_{3D}) for which $\text{div}(\text{Vor } H_{3D}) > 0$.

Law 1 a

An open decelerating cross vortex (E_{2D-}) inward generates an open accelerating longitudinal vortex (H_{3D+}) outward. This action (H_{3D+}) takes place from the center of decelerating cross vortex (E_{2D-}) through a particular cross-longitudinal transformation $\Delta 1-$:

$$\Delta 1-$$

$$\text{Vor}(E_{2D-}) \Rightarrow \text{Vor}(H_{3D+}) \quad (3a)$$

The Law 1 corresponds only to inside Gravity center (Figure 2a).

Results (The model of periphery(free) electron): It describes in 2D the model of electron as the decelerating inward vortex (dec (e-)) (Figure 2e) in periphery of the chain of proton-electron (Figure 2b - Figure 2a). Every electron (dec(e-)) of this type is “expanded transverse vortex” that pulsates in time in 3D in two modes of - in and out. Surely this type of electron rotates at outside orbits (orbitals). The free electrons have similar structure as well.

This type of electron (dec(e-)) is in periphery of a proton-electron system. It has decelerating transverse vortex (E_{2D-}) inward with big radius. In 3D electron generates an accelerating longitudinal vortex (H_{3D+}) upward with less amplitude (Figure 2e).

Result (The model of periphery planet): It describes in 2D the model of planet as the decelerating inward vortex (dec (e-)) (Figure 2e) in the chain of Sun-planet (Figure 2b - Figure 2a). Every planet (dec(e-)) of this type is “expanded transverse vortex” that pulsates in time in 3D in two modes of - in and out. Surely this type of planet rotates at outside orbits (orbitals).

Result (The model of planet Earth): In periphery of a Sun system is a planet **Earth**. It

has decelerating transverse vortex (E_{2D-}) inward with **big radius**. In 3D planet generates an accelerating longitudinal vortex (H_{3D+}) upward with **less amplitude** (Figure 2e).

Law 1 b

An open accelerating cross vortex (E_{2D+}) inward generates an open decelerating longitudinal vortex (H_{3D-}) outward. This action (H_{3D-}) takes place from the Gravity center of accelerating cross vortex (E_{2D+}) through a particular cross-longitudinal transformation $\Delta 1+$:

$$\Delta 1+$$

$$\text{Vor}(E_{2D+}) \Rightarrow \text{Vor}(H_{3D-}) \quad (3b)$$

Results (An electron in inner orbits): The type of electron (acc(e-)): when the electron is inside a proton-electron system (connected in the atom) has accelerating transverse vortex (E_{2D+}) inward with less radius. In 3D electron generates a decelerating longitudinal vortex (H_{3D-}) upward with longer amplitude (Figure 2f). Therefore, because of accelerating inward transverse vortex this type of electron rotates in inner orbits (Markova, 2015).

Results (A planet in inner orbits): The type of planet (acc(e-)) is inside a Sun-planet system has accelerating transverse vortex (E_{2D+}) inward with less radius. In 3D the planet generates a decelerating longitudinal vortex (H_{3D-}) upward with longer amplitude (Figure 2f).

Result (The model of planet Mercury): Because of accelerating inward transverse vortex the planet Mercury rotates in inner orbits. It has longer longitudinal vortex and very little transverse vortex as radius (Markova, 2015).

Law 2

Law 2: The open longitudinal vortex (H_{3D}) (inward or outward) generates an open cross vortex (E_{2D}) in its Gravity center through a longitudinal-cross transformation $\Delta 2-$ (Markova, 2015; 2019; 2020b):

$$\Delta 2$$

$$\text{Vor}(H_{3D}) \Rightarrow -- \text{Vor}(E_{2D}) \quad (4)$$

Law2a

The open decelerating longitudinal vortex (H_{3D}) downward generates an open accelerating cross vortex (E_{2D+}) outward. This action takes place in the center of accelerating cross vortex (E_{2D+}) through a particular longitudinal-cross transformation $\Delta 2$ -:

$$\Delta 2-$$

$$\text{Vor} (H_{3D} -) \Rightarrow \text{Vor} (E_{2D} +) \quad (4a)$$

Results (The model of periphery proton):

This Consequence (4a) describes in 3D the model of proton in 2D. This means that the decelerating longitudinal vortex in 3D generates accelerating cross vortex in 2D (Figure 2b) in the chain of periphery proton- periphery electron. Therefore the decelerating longitudinal vortex with less vector (in height) in 3D generates accelerating cross vortex with big radius (in width) in 2D (Figure2b) in the chain of periphery electron-periphery proton (Figure 2b - Figure 2a).

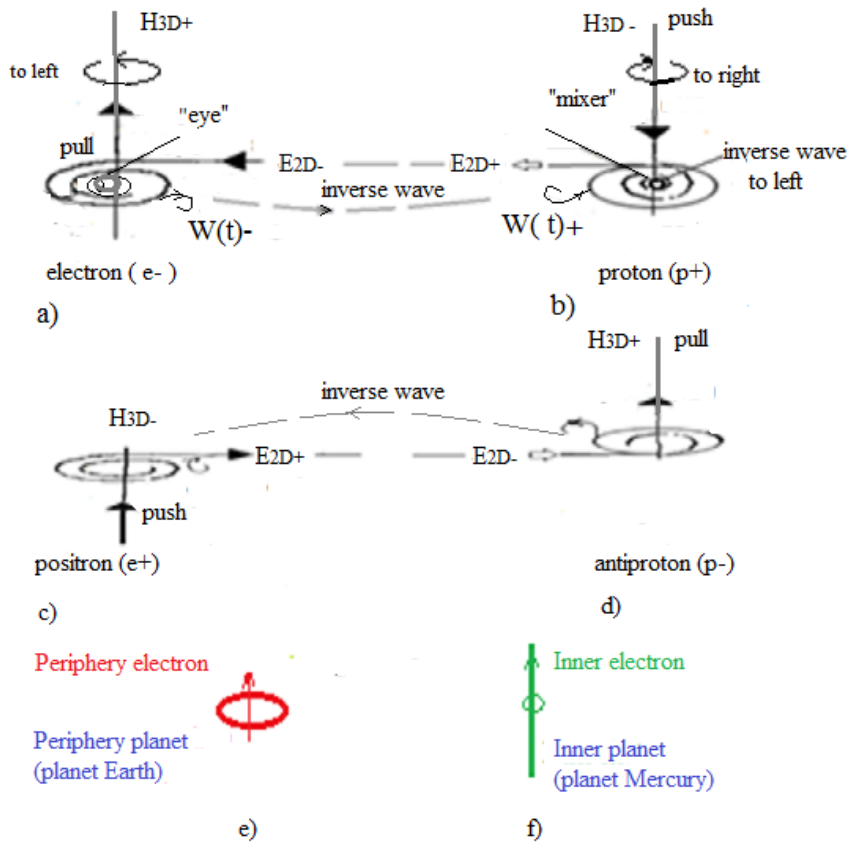


Figure 2. Two Transformation Laws (Law1Law2)

Options in Two Complementary Complex Objects: (e;p+) and (e+;p-).

Figure 2a) Model of Electron; Figure 2b) Model of Proton; Figure 2c) Model of Positron;

Figure 2d) Model of Antiproton; Figure 2e) Model of Periphery Electron and Planet;

Figure 2f) Model of Inner Electron and Planet

Results (The model of outer resonator in Sun): According the description of periphery and outer proton, the outer resonator will have

less vector in height and big vector in width (in radius).

Result (The model of resonator of Earth as periphery planet): The third resonator corresponding to the third planet Earth will have less size in height and bigger size in width.

What's more - it turns out that the width and height of the resonator on Earth are almost the same. In 3D, this third resonator has the appearance of a cube with maximum volume. For comparison - the resonator of Mercury has the appearance of an upright parallelepiped, and the resonator of Mars has the appearance of a lying parallelepiped (matchbox type). Both resonators have almost the same volume they have but very different energies in quality,

Result (The third resonator corresponding to the third planet Earth has maximum volume): The fact that the third resonator inside the Sun, corresponding to the third planet Earth, has the maximum volume compared to the other resonator. This determines the privileged position of the Earth compared to the other planets.

Result (The privileged position of planet Earth): The maximum volume of resonator inside the Sun determines the privileged position of the Earth compared to the other planets. This means that the Earth receives from the Sun the maximum potential energy in the form of transverse vortices and maximum kinetic energy in the form of a longitudinal bundle of vortices.

Law 2b

The open accelerating longitudinal vortex (H_{3D+}) downward generates an open decelerating cross vortex (E_{2D-}) outward in its center through a special longitudinal-cross transformation $\Delta 2+$:

$$\Delta 2+$$

$$V_{or} (H_{3D+}) \Rightarrow V_{or} (E_{2D-}) \quad (4b)$$

Results (The model of central proton): The decelerating longitudinal vortex with longer vector (in height) in 3D generates accelerating cross vortex with less radius (in width) in 2D (Figure 2b) in the chain of electron-proton (Figure 2b - Figure 2a).

Result (The model of inner resonator in Sun): The inner resonator will have less vector in width (in radius) and big vector in height.

Result (The model of inner resonator of Mercury): The first (the innermost) resonator corresponding to the first (innermost) planet Mercury has a big size in height and less size in width. For comparison - the resonator of Mercury similar to an upright parallelepiped, and the resonator of Mars has the appearance of a lying parallelepiped (matchbox type). Both resonators have almost the same volume but they have very different energies in quality.

Law 5

Law 5 in 3D

The deceleration vortex in 3D is described with a system of 4 equations in which: longitudinal velocity (V) decreases in (n) portions (ψ^n) times; the angular velocity (w), the amplitude (W) and the number (N) of cross vortices increase in (n) portions (ψ^n) times:

$$I V(t)^2 = V_0 (V_0 - V(t))$$

$$I W(t)^2 = W_0 (W_0 + W(t)) \quad (5a)$$

$$I w(t)^2 = w_0 (w_0 + w(t))$$

$$I N^2 = N_0 (N_0 + N)$$

where the roots v_n , w_n and ω_n and n_n are expressed as: $v_n = (1/\psi^n) \cdot V_0$, $\omega_n = \psi^n \cdot W_0$; $w_n = \psi^n \cdot W_0$, $[n_n] = \psi^n \cdot N_0$; linear velocity V_0 is the starting value of V_n , amplitude of cross vortex W_0 is the starting value of ω_n , angular velocity w_0 is starting value of w_n , number N_0 is starting value of n_n , $[n_n]$ is the closest integer; ψ is a proportional that fulfills the requirement: $\psi - 1/\psi = 1$; v_n, w_n are periodic roots with period n ; v_n, w_n are mutual orthogonal that fulfill the requirement for orthogonality: $v_n \cdot w_n = V_0 \cdot W_0$, $v_n \cdot \omega_n = V_0 \cdot W_0$; $n = 0 \div \infty$; the roots v_n , w_n and ω_n and n_n are expressed as: $v_n = (1/\psi^n) \cdot V_0$, $\omega_n = \psi^n \cdot W_0$; $w_n = \psi^n \cdot W_0$, $[n_n] = \psi^n \cdot N_0$; linear velocity V_0 is the starting value of V_n , amplitude of cross vortex W_0 is the starting value of ω_n , angular velocity w_0 is starting value of w_n , number N_0 is starting value of n_n , $[n_n]$ is the

closest integer ; ψ is a Golden proportional that fulfills the requirement: $\psi - 1 / \psi = 1$ (Markova, 2015; 2019; 2020b).

Result (A decelerating vortex emits primary cross vortices): A decelerating vortex (E_{2D-}) with a velocity vector (V) emits to the environment decelerating vortices with increasing amplitude (W) (because of positive sign $+$ in second equation of system5 (5a).

The amplitude (W) increases in perpendicular direction to the velocity vector (V). In decelerating longitudinal vortex, the amplitude (W) increases only if it is directed from the inside to the outside, i.e. if the decelerating vortex emits outward cross vortices with increasing amplitude (W) (Figure 3b).

Result (The Law5 describes nonparametric process by the Golden proportion ψ^n): At a decelerating vortex vector velocity (V) is transformed according to internal law as Law 5 ($v_n = (1/\psi^n) \cdot V_0$, $\omega_n = \psi^n \cdot \omega_0$) into the amplitude of the cross vortex (W) (Figure 3b).

Results: (Left rotating accelerating wheels): The emitting of decelerating cross vortices to environment in perpendicular direction forms so called “ quanta “ and this process is called “quantum”.

- According to the Law 1 and Rule of the Right Hand, the decelerating cross vortex (E) generates at the center to outside (to left) a longitudinal vortex (H). So at every n_i point forms left rotating wheel perpendicular to the velocity (V). Therefore, the decelerating longitudinal vortex in 3D forms left rotating spiral (left- counterclockwise when observer watches against the movement). Decelerating longitudinal vortices rotate counterclockwise (-), watched against the movement (Figure 3b).

- Because of increasing of the amplitude (W) the angular velocity (w) and the number of cross vortices (N) it forms decelerating, thickening and expanding left rotating Funnel in which: $W_{max}; w_{max}; N_{max}$.

Result (Right rotating decelerating spiral): The increasing the angular velocity (w) and the number of cross vortices (N) are in every next

wheel. When the observer looks against the direction of moving, he will percept the whole spiral as rotating to right spiral.

Two or more decelerating longitudinal vortices repel each other. The reason is due to the emission of cross vortices from center to outside (Figure 4c).

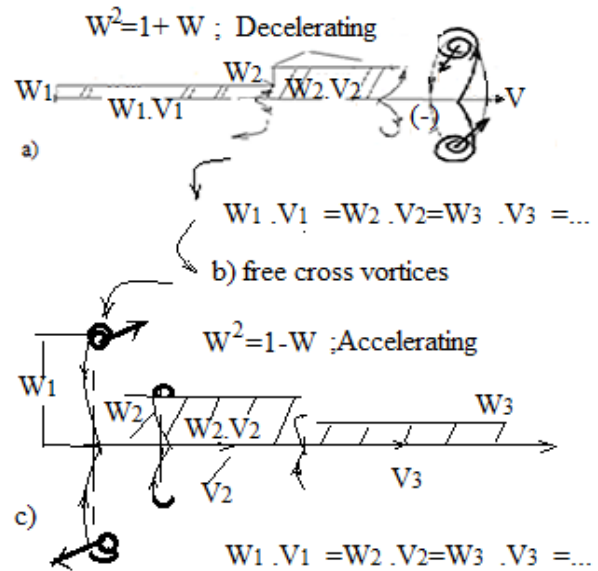


Figure 3. Decelerating Vortex in Law 5, Accelerating Vortex in Law 6.

Figure 3a) Decelerating vortex in Law 5-when velocity V decreases the amplitude W increases so that: $W_i \cdot V_i = \text{const.}$;
Figure 3b) Free cross vortices;
Figure 3c) Accelerating vortex in Law 6-when velocity V increases the amplitude W decreases so that: $W_i \cdot V_i = \text{const.}$;

Law 6

Law 6 for 3D: The acceleration vortex (accelerating Funnel in center) in 3D is described with a system of 4 equations in which: longitudinal velocity (V) increases in (n) portions (ψ^n) times, the angular velocity (w), the amplitude (W) and the number (N_n) of cross vortices decrease to zero in (n) portions (ψ^n) times:

$$I V(t)^2 = V_0(V_0 + V(t)) \quad (6a)$$

$$I W(t)^2 = W_0(W_0 - W(t))$$

$$I w(t)^2 = w_0 (w_0 - w(t))$$

$$I N^2 = N_0 (N_0 - N_n)$$

where the roots v_n , w_n and ω_n and n_n are expressed as: $v_n = (\psi^n) \cdot V_0$, $\omega_n = (1/\psi^n) \cdot W_0$, $w_n = (1/\psi^n) \cdot W_0$, $n_n = (1/\psi^n) \cdot N_0$; linear velocity V_0 is the starting value of V_n , amplitude of cross vortex W_0 is the starting value of ω_n , angular velocity w_0 is starting value of w_n , number N_0 is starting value of n_n ; ψ is a Golden proportion that fulfills the requirement: $\psi - 1/\psi = 1$; v_n, w_n, n are periodic roots with period n ; v_n, w_n are mutual orthogonal that fulfill the requirement for orthogonality: $v_n \cdot w_n = V_0 \cdot W_0$, $v_n \cdot \omega_n = V_0 \cdot W_0$; $n = 0 \div \infty$; the roots v_n , w_n and ω_n and n_n are expressed as: $v_n = (\psi^n) \cdot V_0$, $\omega_n = (1/\psi^n) \cdot W_0$, $w_n = (1/\psi^n) \cdot W_0$, $n_n = (1/\psi^n) \cdot N_0$ (Markova, 2015; 2019; 2020b);

The first positive root of the first equation is:

$$v_1 = \psi \cdot V_0 = 1,62.$$

V_0 . The periodic roots of the first equation are obtained from the expression:

$$v^n = V_0 \cdot (v^{n-1} + v^{n-2}).$$

The first positive root of the second equation is: $w_1 = (1/\psi) \cdot W_0 = 0,62 \cdot W_0$. The periodic roots of the second equation are obtained from the expression: $w^{n-2} = W_0 \cdot (w^n - w^{n-1})$. Therefore, when velocity (V) increases, the amplitude (W) decreases so that at each step (n_i) (according to Consequence of Law 4) the product ($V_i \cdot W_i$) is a constant (Figure 4a). For an accelerating longitudinal vortex, the amplitude (W) decreases only if it is directed from the outside to inside, ie. if the accelerating vortex sucks in cross vortices with decreasing amplitude (W) (Figure 4c)

Result (The Law 6 describes a nonparametric process by Golden proportion $(1/\psi^n)$): At an accelerating vortex vector velocity (V) (first equation of 7a) is transformed according to internal Law 6 into the amplitude of the cross vortex (W) (second equation of 7a) (Figure 3a). For comparison- in the previous point we saw that at a decelerating vortex vector velocity (V) is transformed according to internal Law 5 into the amplitude of the cross vortex (W). More precisely- the

increasing in speed (V) ($\psi^n \cdot V_0$) is transformed into an decrease in the amplitude (W) ($1/\psi^n \cdot W_0$) of cross vortices (Figure 3a).

Results (The accelerating vortex *suck in free primary cross vortices*): When an outer accelerating vortex passes through this passive dipole composed of free cross vortices, according to Law 5 it will suck in them. As a result, the accelerating vortex will increase its positive acceleration, mass and Power because it will add the mass and energy of the passive dipoles. Said more detailed- an accelerating vortex (E_{2D+}) with a velocity vector (V) sucks in accelerating vortices with decreasing amplitude (W) in perpendicular direction (because of sign - in second equation of system 6a). The sucking of accelerating cross vortices from environment in perpendicular direction forms so called "quanta" and this process is called "quantum".

Result (Accelerating vortex form decelerating right rotating wheels):

According to the Law 1 the accelerated cross vortex (E_{2D+}) generates (sucking) inward to its Gravity center a longitudinal vortex (H_{3D}) from the outside to inside. At each point (i) a right rotating wheel is formed. But in time the spiral in 3D is formed as a left rotating spiral in Funnel. Therefore, the wheel of accelerating vortex will twist to the right (clockwise (+), viewed against the movement (Figure 3c).

Result (The accelerating vortices form stretching narrowing and left rotating spiral):

Because of the amplitude (W), angular velocity (w) and the number of cross vortices (N) decreases it forms accelerating, stretching, narrowing, **left rotating spirals** in which: $W_{min}, w_{min}, N_{min}$ (Figure 3b).

Result (The accelerating vortices form Funnel):

The reason is that two or several accelerating longitudinal vortices, due to the suction of cross vortices, attract each other, insert one in another and form an accelerating Funnel. In center inserts the fastest vortex, outside rotates vortex with less velocity and at periphery rotates vortex with the smallest speed. The reason for attraction is increasing the velocity with positive acceleration and

decreasing the amplitude of transverse vortices with positive acceleration as well (Figure 4a).

Very briefly about the Sun-Earth System Based on new Axioms and Laws (Markova, 2023)

Description

The proposed Sun-Earth system was created on the basis of the two new Axioms and the eight new Laws 2. It should also be emphasized that the processes are very generally and roughly described. In reality the relationships are considerably more complex, but for the purposes of this article the proposed description is sufficient.

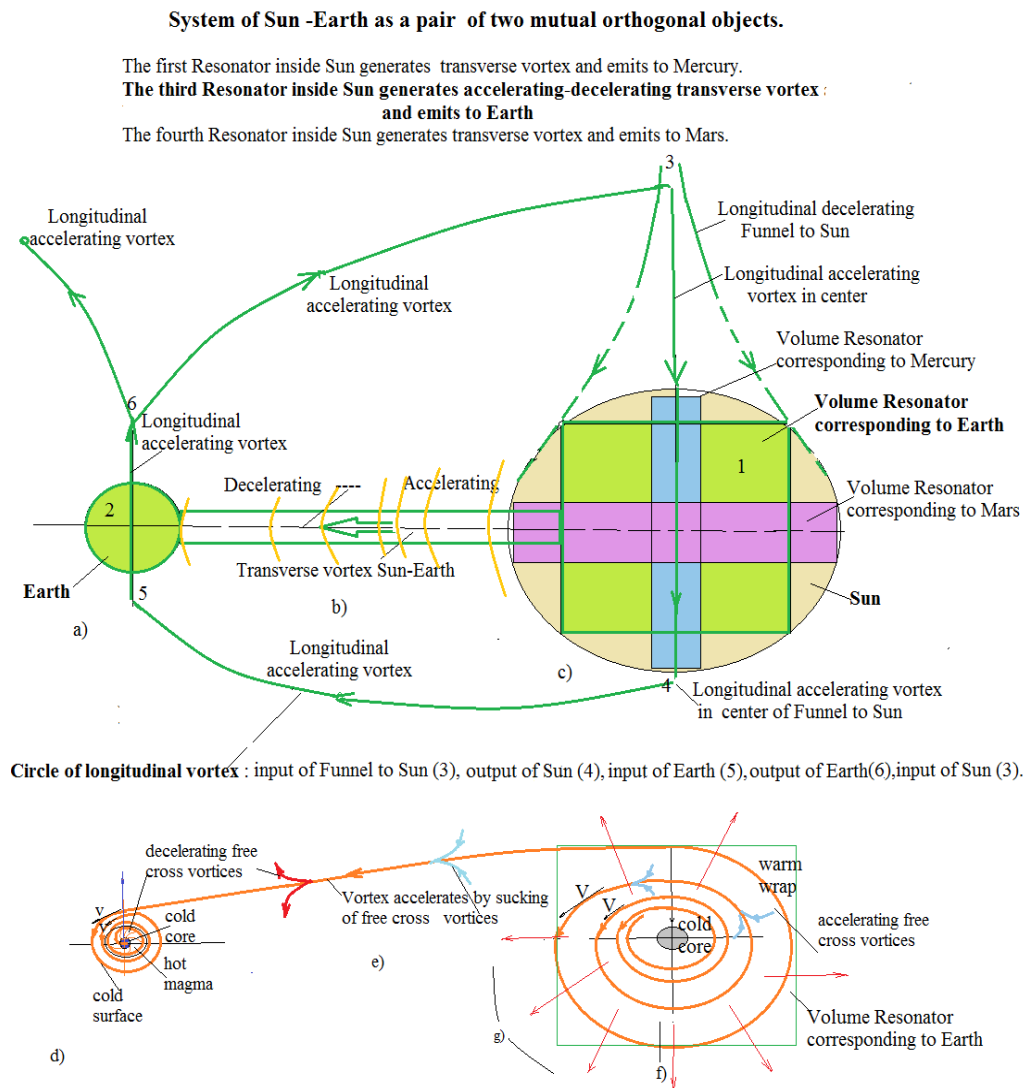


Figure 4. The System Sun (1) –Earth (2)

- Figure 4a) Model of Earth as toroid; Figure 4b) Model of longitudinal link between Sun and Earth; Figure 4c) Model of Sun as ball with Volume Resonators inside;**
- Figure 4d) Model of Earth as decelerating transverse vortex from out to in;**
- Figure 4e) Model of accelerating –decelerating Funnel (from inserted one in another longitudinal vortices) between Sun and Earth;**
- Figure 4f) Model of Sun as accelerating transverse vortex from in to out;**
- Figure 4g. Solar rays generated by HF pulsation of the Sun's Funnel.**

- On the one hand, it can be seen that the Earth is generated in the corresponding third volumetric resonator. It emits the more massive vortices with a certain frequency and heavier energy, arranged in a sort of Funnel. This Funnel plays the role of the real component of the total energy of the Sun. As a result of the acceleration and centrifugal forces, this Funnel (Figure 4b) is launched accelerative-delayed from Sun towards the Earth (Figure 4c - Figure 4a) (Markova, 2023).
- Additional information is given by the picture of the Sun-Earth system, drawn in Figure 4 d,e,f. An analogy can immediately be made with the proton-electron system (Figure 2b-Figure 2a). The more precisely described is that the Earth and Mars look like outer electrons. For comparison - Mercury has a typical structure and characteristics of an inner electron (Markova, 2022b). On the other hand, it can be seen that simultaneously with the above, all volumetric resonators in the Sun's plasma emit from the inside-out accelerating single and lighter vortices with significantly more accelerated energy to its surrounding space (Figure 4g). These single accelerating vortices play the role of an imaginary component of the total energy of the Sun) (Markova, 2022b; 2023).

Conclusion: The ultimate goal is to show that the accelerating lighter vortices generated and emitted by the Sun (Figure 4g) to the surrounding space can play the role of an absorber in the act of cold nuclear fusion.

Consequences

According to Law2, the Sun is generated by a longitudinal decelerating Funnel and emits an accelerating transverse vortex with an inside-out direction (Figure 4c). There are many details and subtleties in this transformation, but for now we will not deal with it. For example, the generating longitudinal Funnel rotates to the right, viewed against the motion and it creates a right transverse wave in core. But transverse rotating to right the core generates a left transverse vortex in the form of a reverse wave (Figure 4f).

It is logical that the longitudinal vortex and the longitudinal funnel are invisible to light. The reason is that the light waves are not reflected by the threads of the longitudinal vortices and an outside observer cannot perceive them. And more precisely - light waves propagate as transverse vortices and when they cross the thread of the longitudinal vortex they form diffraction by bypassing it and continuing their journey with the same speed and direction (Markova, 2015; 2019; 202b). Therefore, the output connection from the Sun to the Earth as well as the input Funnel to the Sun are invisible to an observer.

Result: Because of diffraction between light wave and longitudinal thread the output connection from the Sun to the Earth as well as the input Funnel to the Sun from Space are invisible to an observer.

The structure of the longitudinal Funnel is the following: In center of Funnel moves longitudinal vortex with maximum linear velocity and zero angular velocity. And outside rotates an adjacent vortex with less linear velocity and maximum angular velocity. It turns out that the central vortex is an accelerating vortex but every outer adjacent vortex becomes more and more slow(Figure 4c) -) (Markova, 2019; 2020b).

According to Law 6 accelerating vortex passes through the plasma (3-4) without friction (Figure 4c). The reason is that it sucks to itself free vortices (Markova, 2003; 2005).

Thus in center of the Sun passes perpendicular accelerating longitudinal vortex and it cools the core.

Result: The accelerating longitudinal vortex is inserted in the center of longitudinal Funnel (in 3D), that is perpendicular to transverse vortex (in 2D). Because it is accelerated, it cools the core of Sun.

According to Law 6, during the acceleration, free transverse vortices are sucked in and thus the vortex accelerates more and more (Figure 4c). The driving force comes from the initial speed of the main transverse vortex, and the free

vortices sticking together turn the initial velocity into positive acceleration. The initial velocity of the transverse vortex is generated by the last wheel of the decelerating longitudinal Funnel because it has maximum angular velocity (Figure 4f) (Markova, 2003; 2005).

According to Law 5 the last wheel of decelerating longitudinal vortex moves with a zero linear velocity and a maximum angular velocity as the last wheel of longitudinal vortex has a maximum radius (Figure 4c) (Markova, 2015; 2019). According to Law 6, the transverse accelerating vortex in the center has a small linear velocity, and to periphery becomes maximum (Figure 4f) (Markova, 2020b).

Result: Because generating vortex starts from center to periphery the rotation speed of the central core of Sun is much smaller than periphery part.

Towards the periphery, the linear velocity increases every point by (ψ^n) times (Markova, 2003; 2005; 2015). And finally the rotation speed reaches large values. Each of resonator inside the Sun spins inside itself a precisely defined transverse vortex with a precisely defined frequency and speed. Finally, it takes off accelerated and centrifugally from each resonator almost perpendicularly from it (Figure 4e). The velocity of this exit Funnel is maximum equal to light speed. The energy of this exit Funnel is with lower- frequency, heavier and denser. It plays a role of real part from total energy of Sun) (Markova, 2022b; 2023).

Result: In accelerating -decelerating Funnel shooting from Sun to Earth the linear velocity is commensurate to light speed.

Each of resonator inside the Sun generates light beams Finally, they takes off accelerated from all resonators in Sun almost perpendicularly from it to environment (Figure 4g). The velocity of this beams is much more than light speed. The energy of these beams is with higher - frequency and lighter. This energy plays a role of imagine part from total energy of Sun (Markova, 2003; 2023).

Result: In accelerating beams shooting from Sun to environment the linear velocity reaches a size more than light speed.

What's up with the Sun? The longitudinal acceleration beams, which reaches enormous speed and energy, does not emit heat (Markova, 2022b).

Even vice versa - sucking matter and energy from the surrounding space, the accelerating beams from Sun cools its space around. They cool the medium through which it passes including space between Sun and Earth (Law 6) (Markova, 2003; 2005).

Result: Because the beams from Sun are accelerated and reach maximum linear velocity and kinetic energy they do not emit heat to environment.

According to Law 5, the source of heat is only the decelerating vortices (Markova, 2003; 2005).

But in the Sun there are not decelerating vortices. Actually in Sun there are only accelerating transverse vortices (Markova, 2023).

Therefore, there is no reason why the internal generation of the Sun to cause the radiating heat. The only way the Sun emits heat is through nuclear fusion, which actually emits a large amount of heat.

Result: In Sun heat is released only from the exothermic nuclear reaction between two deuterium resulting in helium.

Therefore, the heat is released only from the exothermic nuclear reaction between two deuterium resulting in helium. Heat is also released from the numerous transverse loops and protrusions. Generally speaking the decelerating vortices carry heat, the accelerating vortex carries cool.

Result: The positive acceleration of accelerating vortex of Sun sucks and sticks the deuterium atoms and after helium is produced, heat is released.

The phenomenon of emitted accelerating Funnel and accelerating beams from the Sun has not yet been fully studied and explained.

Proposal for Cold Nuclear Fusion

If we can simulate generation of an accelerating vortex (Law 6) and if we pass it through a medium saturated with deuterium we will synthesize helium with the release of energy.

The reason is that many of the atoms of the deuterium are attracted to the longitudinal vortex with a force proportional to the acceleration. They are dragged and stick together as part of them fuse and form helium. The synthesis process itself releases energy. The process is carried out at normal temperature and does not need additional heating. The process only needs a significant acceleration that even cools the medium (Law 6) (Figure 3b) (Markova, 2005; 2015; 2019; 2020b).

The problem is in generating an accelerating vortex. In practice we can generate a longitudinal accelerating vortex imitating the result of Law 1 on base of new Axioms and Laws.

How an accelerating vortex is generated according to the new Axioms and Laws is shown in a previous works by the same author. According Law1 a decelerating vortex (in 2D) from outward to inward generates an accelerating vortex (in 3D) in center, perpendicular to the plane (2D) of decelerating vortex. The reason is decelerating vortex from out to inn (in 2D), but result is accelerating vortex from center to up (in 3D). By the way this accelerating vortex plays role of generator of antigravity force (Figure 4a, d) (Markova, 2018a; 2018b; 2020a).

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