



RESEARCH ARTICLE

SUPERCONDUCTIVITY, ACCORDING TO THE NEW AXIOMS AND LAWS

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ABSTRACT

The article describes the application of brand new field type through New Axioms and Laws. The present study uses Expanded Field Theory. It changes the Classic Field Theory to a much more general theory that consists of 2 new axioms and 8 laws. It was described from previous works of the same author. In this report is used only 1 axioms and 6 laws only. It is known that Maxwell's laws (1864) are based on a single axiom [1]. It states that the movement in a closed loop leads to evenly movement (with constant speed) of a vector E : $\text{div rot } E = 0$. The author change this axiom with a new one, according which the movement in an open loop or vortex leads to unevenly movement (with variable speed) of a vector E : $\text{div rot } E \neq 0$, $\text{div } V$ or $E \neq 0$ for vortex [2]. The subsequent results are: the evenly movement is replaced with unevenly movement which can be decelerating or accelerating; in 2D it exists a cross vortex and in 3D it exists a longitudinal vortex; the cross vortex in 2D is transformed to a longitudinal vortex in 3D through a transformation $\Delta 1$; the longitudinal vortex in 3D is transformed to a cross vortex in 2D through special transformation $\Delta 2$; decelerating vortex emits free cross vortices to the environment that are called "free energy"; accelerating vortex sucks the same ones free cross vortices and so on. The vector E is not a simple. It turns to be a complex vector: $E=A+iV$, $E=V+iA$ or $E=-A-iV$, $E=-V-iA$. It can has or amplitude A in a real part, or velocity V as a real part. Cross vortices can form two kinds vortices: a vortex that is generated by amplitude A and the vortex that is generated by velocity V . Each of these may be accelerating or decelerating. Both of them are generators. They are prototypes of material particles. Due to the suction of cross vortices by the accelerating vortex the temperature decreases and due to the emitting of cross vortices by the decelerating field the temperature increases. Inside of the conductor the velocity of Electromagnetic field is constant. On the periphery it decelerates because of resistance to the wall of conductor. This report offers a specific application of the above theory. In order to understand the nature of superconductivity we have to understand first the nature of conductivity by conductor. Then we can very easily model a superconductor by constructing it orthogonally on the conductor.

INTRODUCTION

The Classic Axiom in the Theory of the Electromagnetic Field certifies Maxwell's laws (1864). It postulates that the movement of an electric vector E in a closed loop is evenly:

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

where $(\text{rot } E)$ is the movement of the vector E in a closed loop; $\text{div}(\text{rot } E)$ is the divergence (the variation in increase or decrease is zero) of the vector E during its movement in a closed loop $(\text{rot } E)$; the movement of the vector E in a closed loop $(\text{rot } E)$ with zero divergence (variation) of the vector E is equivalent to evenly movement or to movement with constant velocity (V) [1].-The defect of the classic axiom (1) is that it does not describe movement in an open loop or a vortex and movement with a variable velocity V . Now is the time to break the restriction of Maxwell's axiom (1) and to expand the space explained by the new theory.

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The main motivation for altering the classic axiom (1) follows after the need to describe the cause for an uneven movement in open systems. It turns out that open vortices are the cause of closed vortices, which means that open vortices are more fundamental than closed ones [2]. So it is the necessity to change the existing axiom of the Classic Field Theory for closed loop to axioms of Expanded Field Theory for open loops [2]. So the new axiom describes an open loop movement.

$$\text{div}(\text{rot } E) \neq 0. \quad 2.$$

For motion of vector E $(\text{rot } E)$ along open loop with monotone-decreasing or monotone-increasing velocity is equivalent to vortex $(\text{Vor } E)$.

New Axiom

Axiom 1. The motion of vector with monotone-decreasing or monotone-increasing velocity becomes along an open vortices: $\text{div}(\text{Vor } E) \neq 0$ for vector E in 2D or $\text{div}(\text{Vor } H) \neq 0$ for vector H in 3D.

$\text{div}(\text{Vor } E) > 0$ or $\text{div}(\text{Vor } E) < 0$ in 2D, 2a.

$\text{div}(\text{Vor } H) > 0$ or $\text{div}(\text{Vor } H) < 0$ for 3D. 2b.

Result:(4 types of vortices)

The main result of Axiom 1 is that there has been 4 types of vortices: a cross vortex in 2D (E2D) that can be accelerated (E2D +) or decelerated (E2D -) and a longitudinal vortex in 3D (H3D) that can also be accelerated (H3D +) or decelerated (H3D -), (Figure1c,d) [3].

Result:(eccentric spiral)

We are accustomed to the wrong image of a spiral with a constant distance between the turns. But it is “unreal” spiral (Figure 1,b). Because if it is a spiral, it must be accelerated (accelerating or decelerating). If there is no acceleration, then it is not a spiral but it is closed loop. The reason is in the acceleration of velocity. The real spiral is eccentric spiral. 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 $E2 > E4$ and at the same time the Geometric Center will aim to move to the larger vector $E2$ (to the left). Therefore, the Geometric Center will move to a second quadrant or to the Gravity Center (Figure 1b) [3].

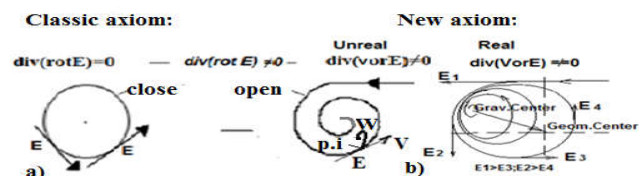


Figure 1. The classical axiom is replaced by a new axiom

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) (Figure 1b). The two simultaneous movements (V and W) also exist at all points of the vortex. The cross vortex (E2D -) is transformed into a longitudinal vortex (H3D+). This is accomplished through a specific operator (Δ1) for cross-longitudinal transformation (Figure 2c). The transformation Δ1 connects two spaces with different qualities.

New Laws

Law 1: The open cross vortex (E2D) generates (inward or outward) an open longitudinal vortex (H3D) in its center through a cross-longitudinal transformation Δ1:

$\text{Vor}(E2D) \Rightarrow -\text{Vor}(H3D)$, 3.

where Vor (means an unevenly vortex) replaces rot (means a closed loop).

-The cross vortex in 2D (E2D) continues its development in 3D as a longitudinal vortex (H3D) (Figure 2c).

Result: (the cross vortex of E in 2D continues as a longitudinal vortex of H in 3D)

The Maxwell’s law states that rotor of vector E generates in center vector H: $\text{rot } E = H$ [1]. But the present Law1 postulates

that the cross vortex Vor (E2D) of E in 2D generates a longitudinal vortex Vor (H3D) of H in 3D. The sign (-) for Vor (H3D) 3D means that E2D and H3D have opposite dynamics. For example when $\text{div}(\text{Vor } E2D) < 0$ (is decelerated), $\text{div}(\text{Vor } H3D) > 0$ (is accelerated).

Definitions

- A decelerating cross vortex (E2D-) is a cross open vortex (E2D) for which $\text{div}(\text{Vor } E2D) < 0$.
- A decelerating longitudinal vortex (H3D-) is a longitudinal open vortex (H3D) for which $\text{div}(\text{Vor } H3D) < 0$. Figure 2b shows a decelerating longitudinal vortex (H3D-) inward.
- An accelerating cross vortex (E2D+) is a cross open vortex (E2D) for which $\text{div}(\text{Vor } E2D) > 0$.
- An accelerating longitudinal vortex (H3D+) is a longitudinal open vortex (H3D) for which $\text{div}(\text{Vor } H3D) > 0$.
- The decelerating cross vortex (E2D-) inward generates an accelerating longitudinal vortex (H3D+) outward in its center through a physical transformation (Δ1-) (Figure 2c). This transformation (Δ1-) is achieved through a phenomenon called Full resonance (resonance in amplitude, frequency and phase). This type of resonance will be described in detail in further developments and reports.

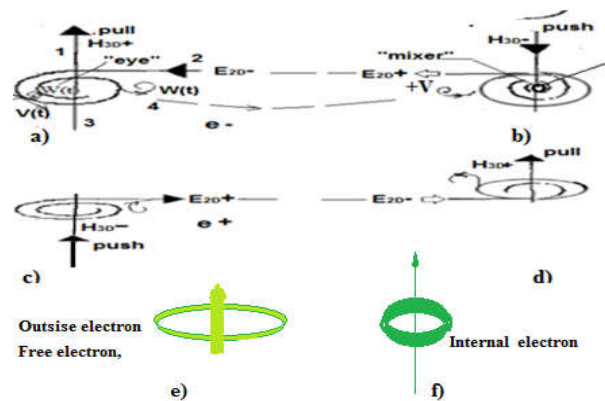


Figure 2. Two Transformation Laws. Options in two complementary complex objects

Consequence: The open decelerating cross vortex (E2D -) inward generates an open accelerating longitudinal vortex (H3D +) outward. This action takes place from the center of decelerating cross vortex (E2D -) through a particular cross-longitudinal transformation Δ1-:

$\Delta 1-\text{Vor}(E2D -) \Rightarrow \text{Vor}(H3D +)$. 3a.

Figure 2a shows this transformation in 3D.

The Consequence of Law1 corresponds only to the pulling part from inside center (Figure 2a) of the cross vortex pair of objects in 2D (Figure 2a - Figure 2b).

Results: (the model of electron)

This Consequence describes in 2D the model of electron as the decelerating inward vortex (dec (e-)) (Figure 2c) in the chain of proton-electron (Figure 2d - Figure 2c).

Every electron (dec(e-)) of this type: " expanded cross vortex "pulsates in 3D in two modes of: in and out. Surely this type of electron rotates at outside orbits (orbitals). If Law1 generates in 3D a simple and single longitudinal vortex, it would describe the Expanded Maxwell' law for Electromagnetic Field: $(\text{Vor } E)_{2D} = k(\text{Vor } H)_{3D}$.

Result:(Gravity Funnel)

If Law1 generates in 3D a pipe - wrapped vortices from longitudinal vortices inserted into each other, it describes another field with properties inverse to the Electromagnetic Field Actually it describes the Gravity Field as a Gravity Funnel. Gravity funnel is generated in 3D tubes of longitudinal vortices as an longitudinal energy in pulling part outward (Figure2c) of the pair of complementary objects (Figure2c – Figure2d) [7,8].

Consequence: The open accelerating cross vortex (E2D +) inward generates an open decelerating longitudinal vortex (H3D -) outward. This action takes place from the center of accelerating cross vortex (E2D +) through a particular cross-longitudinal transformation $\Delta 1+$:

$$\Delta 1 + \text{Vor} (E2D +) \Rightarrow \text{Vor} (H3D -). \quad 3b.$$

Results:(4 types of electrone-)

We immediately obtain the models of 4 types of electrons(e-) : (dec(e-)) and (acc(e-)) " electrons, which each of them pulsates in two modes: " expanded cross vortex" and a "shrunk cross vortex ", each of them pulsate in time and in 3D : " in and out " or shrinks inward and swells outward. When it shrinks inward, the electron emits so-called free vortices outward to the surrounding space or to the vacuum.

Results:(electron inside orbits)

The first type of electron(acc(e-)): when the electron is inside a proton-electron system(connected in the atom) has accelerating cross vortex (E2D+) inward that generates a decelerating longitudinal vortex(H3D-) upward. The Consequence of Law1 describes in 2D the model of electron (e-) as the accelerating inward vortex(acc(e)(Figure2c) in the chain of proton-electron (Figure 2d - Figure 2c). Every electron (acc(e-)) of this type : " shrunk cross vortex "pulsates in 3D in two modes of: "in and out". Surely this type of electron rotates in inside orbits (orbitals).

Results:(electron in periphery orbits or electron that is outside of atom or electron called "free" electron)

The second type of electron(dec(e-): when the electron is free (outside of the atom) has decelerating cross vortex (E2D-) inward, which generates an accelerating longitudinal vortex upward (H3D+). It pulsates in time "in and out". When electron shrinks inward, it emits so-called" free"elementary cross vortices outward to the surrounding space or to the vacuum which are prototypes of " free" energy

- When electron is free (second type (dec(e-)), the decelerating cross vortex (E2D-) is broken. But accelerating longitudinal vortex (H3D+) radiates a fast ingredient that connects to the decelerating longitudinal vortex (H3D-) at input of the proton.

- There is a significant difference in the states of a bound electron and a free electron. For example scientists measure the mass of a free electron with a decelerating cross vortex (E2D-)

Results: (4 type of positrons e+)

It exists another two consequences (not described in the article), but they describe decelerating or accelerating cross vortices to outward. This is the 2 type of positrons: (dec(e+)) and (acc(e+)) positrons.

We immediately obtain the models of 4 type of positrons: (dec(e+)) and (acc(e+)) that each of them pulsates in two modes: " expanded cross vortex " vortex and "shrunk cross vortex ", each of them pulsate in 3D : " in and out ".

For the opposite transformation a new operator $\Delta 2$ is introduced to transform a longitudinal (H3D) into a cross (E2D) vortex. The physical nature of this $\Delta 2$ transformation is quite different in comparison with $\Delta 1$. The transformations $\Delta 1$ and $\Delta 2$ are orthogonal, rather than symmetrical to each other.

Law 2: The open longitudinal vortex (H3D) (inward or outward) generates an open cross vortex (E2D) in its center through a longitudinal-cross transformation $\Delta 2$:

$$\Delta 2 \text{Vor} (H3D) \Rightarrow -- \text{Vor} (E2D) \quad 4.$$

Consequence: The open decelerating longitudinal vortex (H3D -) inward generates an open accelerating cross vortex (E2D +) outward. This action takes place in the center of accelerating cross vortex (E2D +) through a particular longitudinal-cross transformation $\Delta 2-$:

$$\Delta 2 - \text{Vor} (H3D-) \Rightarrow \text{Vor} (E2D+). \quad 4a.$$

Results: (4 type of proton p+)

- We immediately obtain the models of 4 types of protons : (dec(p+)) and acc (p+), which each of them pulsates in two modes: " expanded cross vortex" and a "shrunk cross vortex ", each of them pulsate in 3D : " in and out ".
- The Consequence of Law2 in 3D refers to the pushing part (Figure2c) of the pair of complementary objects (Figure2c – Figure2d).The transformation $\Delta 2-$ emphasizes that the movement of the longitudinal vortex (H3D) inward is the cause, but the movement of the cross vortex(E2D) outward is the result (Figure 2d).

Results: (Gravity Funnel)

When the Consequence of Law2 are generated by the pipe - wrapped longitudinal vortices, it describes Gravity field. It has the inverse properties to the Electromagnetic Field. This Gravity field exists as a tube from inserted one in another the longitudinal vortices. It forms a Gravity funnel which has a pushing and a pulling ends. In this case the down end of Gravity Funnel (H3D -) has pushing effect because the pushing end of Gravity funnel is attached to the pushing part (Figure2d) of the pair of objects (Figure2c – Figure2d) This end decelerates in 3D direction and generates in 2D plane (perpendicular to 3D) cross vortex from inside to outside as a matter.

Consequence: The open accelerating longitudinal vortex (H3D+) inward generates an open decelerating cross vortex (E2D-) outward in its center through a special longitudinal-cross transformation $\Delta 2+$:

$$\Delta 2 + \text{Vor (H3D+)} \Rightarrow \text{Vor (E2D-)} \quad 4b.$$

-A necessary condition for generating of elementary particle dec (p+) is the presence of free cross vortices called “free energy”, and a sufficient condition is the longitudinal vortex to work (from out to in) as a mixer (Figure 2b).

- We immediately obtain the models of 4 types of proton: (dec(p+)) and (acc(p+)) that each of them pulsates in two modes: ” expanded cross vortex and “shrunk cross vortex” and “in-out”.

Results: (presence of free cross vortices or “free energy”)

- A necessary condition for generating of elementary particle (p+) is the presence of free cross vortices called “free energy”, and a sufficient condition is the longitudinal vortex to work (from out to in) as a mixer.
- The existence of the electron (e-) is associated with the emission of free cross vortices in the surrounding space.
- If the Law 1 generates a simple and single longitudinal vortex, it would refer to the Electromagnetic field. If the Law 1 generates a pipe - wrapped vortices from accelerating longitudinal vortices inserted into each other, it really generates accelerating Gravity Funnel.
- If the Law 2 is generated by a pipe - wrapped vortices from decelerating longitudinal vortices inserted into each other, it refers to the decelerating Gravity Funnel.

Results: (complementary objects)

The new extended meaning of the term” Complementarity” is when the two parts are generating and they act anti-phase - one push and the other pulls.

- The two transformations $\Delta 1$ (Law1) and $\Delta 2$ (Law2) are not symmetrical but rather form pairs of objects that complement each other in their action. So they form a pairs of complementary objects or they are mutually orthogonal.
- The two vortices in the described above vortex pairs (Figure 2c - Figure 2d) play the role of generators (!) - one push (Figure 2d), the other -pulls (Figure 2c). Obviously in described above chain (Figure 2c - Figure 2d) there is not consumers. Therefore this chain has not energy losses.
- It is well known that in every Electromagnetic chain has generator and one or more consumers. That's why Electromagnetic chain has energy losses.

Results:(nonparametric process)

Both transformations, $\Delta 1$ (Law1) and $\Delta 2$ (Law2), are not regulated by external regulator or external parameters. Therefore the processes are regulated only by internal laws and are not determined by outside parameters.

Obviously the processes of acceleration and deceleration of the longitudinal vortex is a nonparametric process. Processes of accelerating and decelerating longitudinal vortices manifest

both quantitative and qualitative changes [5]. This mechanism of amplification is known in cybernetics as Positive Feedback.

Law 3: Accelerating and decelerating of the main vortex is going by internal logic as a nonparametric process through Positive Feedback.

Results:(redistribution in portions - quanta)

The Law 3 shows that velocity V_i increases by redistribution with cross vortices. There is also redistribution of mass. The mass of the cross vortices is added in portions (quanta) with acceleration to the initial mass of the longitudinal vortex with velocity V_i and thus accelerates it more and more. -The accelerating longitudinal vortex sucks in more cross vortices from outside that accelerate further the longitudinal vortex with velocity V_i and so on. Thus the longitudinal vortex at output (V_i) increases its velocity and acceleration which returns at input. The reason is that it sucks in more cross vortices and increases of the acceleration and mass to the entrance.

Results:(process runs as avalanche)

This process runs as avalanche until it reaches a saturation level where the acceleration becomes maximum (a max) for a time slice Δt . -When, for example, an accelerating vortex sucks in with acceleration the cross vortex, then in start moment ($t=0$) its first derivative is minimum: $a=0$. However the accelerated absorption of the cross vortex increase and when in the end moment ($t=t_n$) the positive acceleration of the cross vortex becomes maximum: $a_{max} \gg 0$.

The mass of this cross vortex is added to the longitudinal vortex accelerating it further (Figure 3b). It is an example of the avalanche process. In the next cycle the accelerated longitudinal vortex again sucks in a portion (quantum) of the cross vortex and so on. Through Positive Feedback the level of saturation constantly increases, the time interval needed for saturation becomes longer, etc. -Positive Feedback turns the described above avalanche process from an amplifier to a generator process.

Result: (Positive Feedback, simultaneous operation of twomutual dependent vectors)

- The Positive Feedback in a longitudinal vortex turns the process of amplification to a process of generation. The Positive Feedback can be a base for constructing an energy generator.
- As we saw above there are two qualitatively different movements at each (i) point p (i) of the decelerating vortex E: longitudinal vector velocity (V) and cross vortex with amplitude (W) (Figure 1,b).The reason of that is the vector E is not a simple vector but it is a complex vector (Figure 1,e,g).

Result: (simultaneous operation of twomutual dependent vectors)

According to the Classical Mechanics, the simultaneous operation of two independent vectors is equal to the sum of these vectors. But according to the New Axiom, simultaneous operation of two mutual dependent vectors is equal to the multiplication of these vectors.

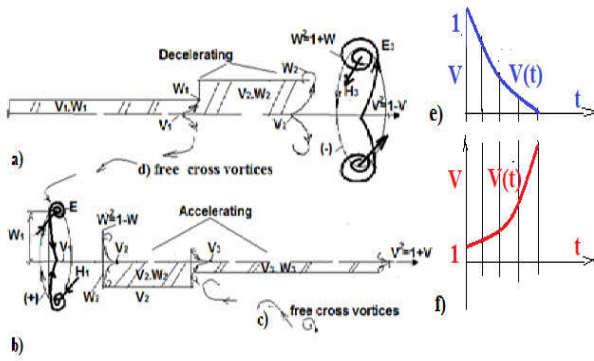


Figure 3. Decelerating-accelerating vortices

According to the Law 3, the transforming one vector (V) into a vortex (W) and vice versa is a nonparametric process. Transformation is done by internal laws but not by outside setting.

- The nonparametric transformation of two variables V (t) and W (t) is mathematically described by the product V (t). W (t) of these variables.
- We have seen that at each (i) point of the vortex E there is simultaneously a vector velocity (V) in 1D and vortex pressure (W) in 2D (Figure 1b).
- In the case of the decelerating longitudinal vortex the velocity decreases (V-), while the amplitude of the cross vortices increases (W+) in such a way that their product (V-).(W+) remains constant all along the longitudinal vortex. The product (V-).(W+) is proportional to the power(P-)of the decelerating longitudinal vortex (Figure 3a).
- In the case of the accelerating longitudinal vortex the velocity increases (V+), while the amplitude of the cross vortices decreases (W-) in such a way that their product (V+).(W-) remains constant all along the longitudinal vortex. The product (V+).(W-) is proportional to the power (P+) of the accelerating longitudinal vortex (Figure 3b).

Law 4: For an uneven (accelerating or decelerating) vortex the product between current velocity (Vi) of longitudinal movement on one and the same current line and current amplitude (Wi) of its perpendicular cross vortices is a constant in every (i) step:

$$(Vi). (Wi)= \text{const.} \tag{5}$$

where $i= 0 \div \infty$ is current point from step to step.

-The product (Vi).(Wi) is proportional to the current power (Pi) of the uneven vortex in current (i) step(Figure 3a). The current power (Pi) of the uneven vortex is a constant in every (i) step(Figure 3a,b.).

- At a decelerating vortex vector velocity (V) is transformed according to internal law into the amplitude of the cross vortex (W) (Figure 3b). At a accelerating vortex vector velocity (V) is transformed according to internal law into the amplitude of the cross vortex (W) (Figure 3c)
- -We saw in the previous point that at a decelerating vortex vector velocity (V) is transformed according to internal law into the amplitude of the cross vortex (W)

(Figure 3a,b). More precisely- the reduction in speed (V) is transformed into an increase in the amplitude (W) of cross vortices.

Law 5: The deceleration vortex in 2D is described with a system of 2 equations in which: longitudinal velocity (V) decreases in (n) portions (ψ^n) times; the amplitude (W) increases in (n) portions (ψ^{-n}) times:

$$\begin{aligned} I V(t)^2 &= V_0(V_0 - V(t)), \\ I W(t)^2 &= W_0(W_0 + W(t)), \end{aligned} \tag{6}$$

where v_n, w_n n are periodic roots with period n; v_n, w_n are mutual orthogonal that fulfill the requirement for orthogonality : $v_n.w_n= V_0.w_0, v_n.\omega_n= V_0.W_0$; $n = 0 \div \infty$; the roots v_n, w_n are expressed as: $v_n=(1/\psi^n).V_0, \omega_n=\psi^n.W_0$; linear velocity V_0 is the starting value of V_n , amplitude of cross vortex W_0 is the starting value of ω_n ; ψ is a proportional that fulfills the requirement: $\psi-1/ \psi =1$; t is continual and even, V_n are uneven(decelerated) and $V(t)$ is nonlinear (Figure 3e).

Consequence: 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:

$$\begin{aligned} I V(t)^2 &= V_0(V_0 - V(t)), \\ I W(t)^2 &= W_0(W_0 + W(t)), \\ I w(t)^2 &= w_0(w_0 + w(t)) \\ I N^2 &= N_0(N_0 + N) \end{aligned} \tag{6a}$$

where v_n, w_n are periodic roots with period n; v_n, w_n are mutual orthogonal that fulfill the requirement for orthogonality : $v_n.w_n= V_0.w_0, v_n.\omega_n= V_0.W_0$; $n = 0 \div \infty$; the roots v_n, w_n and ω_n and n_n are expressed as: $v_n=(1/\psi^n).V_0, \omega_n=\psi^n.W_0$; $w_n=\psi^n.W_0, [n_n]=\psi^n.N_0$; 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: $\psi-1/ \psi =1$. It is noteworthy that : When starting number $N_0=1$ the number n_n is calculated with the row: 1;1.62; 2.62;4.25; 6.88, 11.15;18.07; 29.28;47.43,...The closest integer $[n_n]$ form row: 1,2,3,4,7,11,18,29,47,..For comparison, Fibonacci's order is: 0,1,1,2,3,5,8,13,18,21,34,... Obviously there is a similarity between the two rows at the beginning. But finally (after 18th) the number $[n_n]$ rises sharply (29>21, 47>34,...) compared to the order of Fibonacci.

A decelerating vortex (E_{2D}^-) with a velocity vector (V) emits to the environment decelerating vortices with increasing amplitude (W) (because of sign+in second equation of system 6,6a). 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 3a).

Results: (left rotating wheel)

- The emitting of decelerating cross vortices to environment in perpendicular direction forms so called “ quanta “ and this process is called “quantum”.

- According to the Law1 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) (Figure 3b).Decelerating longitudinal vortices rotate counterclockwise (-),watched against the movement (Figure 3b).

Result:(right rotating decelerating spiral)

- Because of increasing of the amplitude (W) the angular velocity (w) and the number of cross vortices (N) it forms decelerating, thickening and expanding right rotating Funnel in which: $W_{max}; w_{max}; N_{max}$.
- The increasing the angular velocity (w) and the number of cross vortices (N) are in every next wheel. When the observer look against the direction of moving, he will percept the whole spiral as rotatingto 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.

Law 6: The acceleration vortex in 2D is described with a system of 2 equations in which: longitudinal velocity (V) increases in (n) portions (ψ^n) times; the amplitude (W) decreases in (n) portions (ψ^n) times:

$$\begin{aligned} I V(t)^2 &= V_0(V_0 + V(t)), \\ I W(t)^2 &= W_0(W_0 - W(t)), \end{aligned} \quad 7.$$

where v_n, w_n are n periodic roots with period n; v_n, w_n are mutual orthogonal that fulfill the requirement for orthogonality : $v_n.w_n = V_0.W_0, v_n.\omega_n = V_0.W_0 ; n = 0 \div \infty$; the roots v_n, w_n are expressed as: $v_n = (\psi^n).V_0, \omega_n = (1/\psi^n).W_0$; linear velocity V_0 is the starting value of V_n , amplitude of cross vortex W_0 is the starting value of ω_n ; ψ is a proportional that fulfills the requirement: $\psi - 1/\psi = 1$; t is continual and even, V_n are uneven (accelerated) and $V(t)$ are nonlinear (Figure 3f).

Consequence: The acceleration vortex 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) of cross vortices decrease in (n) portions (ψ^n) times:

$$\begin{aligned} I V(t)^2 &= V_0(V_0 + V(t)), \\ I W(t)^2 &= W_0(W_0 - W(t)), \\ I w(t)^2 &= w_0(w_0 + w(t)) \\ I N^2 &= N_0(N_0 - N) \end{aligned} \quad 7a.$$

where v_n, w_n, n are periodic roots with period n; v_n, w_n are mutual orthogonal that fulfill the requirement for orthogonality : $v_n.w_n = V_0.W_0, v_n.\omega_n = V_0.W_0 ; n = 0 \div \infty$; the roots v_n, w_n and ω_n and n_n are expressed as: $v_n = (\psi^n).V_0, \omega_n = (1/\psi^n).W_0, w_n = (1/\psi^n).W_0, n_n = (1/\psi^n).N_0$; 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 proportional that fulfills the requirement: $\psi - 1/\psi = 1$. -The first positive root of the first equation (of 3,3a;4, 4a) is: $v_1 = \psi.V_0 = 1,62.V_0$. The periodic roots of the first equation (of 3,3a;4, 4a) are obtained from the expression: $v^n = V_0.(v^{n-1} + v^{n-2})$.

The first positive root of the second equation (of 3,3a,4, 4a) is: $w_1 = (1/\psi).W_0 = 0,62.W_0$. The periodic roots of the second equation (3,3a; 4, 4a) are obtained from the expression: $w^{n-2} = W_0.(w^n - w^{n-1})$. Therefore when velocity (V) increases, the amplitude (W) decreases so that at each step (n_i) (according to Consequence of Law 4) the product (Vi). (Wi) is a constant (Figure 4a).For an accelerating longitudinal vortex, the amplitude (W) decreases **only if** it is directed from the outside to inside, i.e. if the accelerating vortex sucks in cross vortices with decreasing amplitude (W)(Figure 4c)

Results: (suck in free cross vortices)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 7,7a**).

-According to the Law1 the accelerated cross vortex(E_{2D}^+) generates (sucking) to its center a longitudinal vortex(H_{3D}) from the outside to inside(to the right). At each point (i) a right rotating wheel is formedTherefore, the acceleration vortex will twist to the right – clockwise (+), viewed against the movement (Figure 3b).But, because of decreasing angular velocity (w), the rotation of whole accelerating spiral it will seem to be in left – counter clockwise (-), viewed against the movement.

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

- Two or several accelerating longitudinal vortices, due to the suction of cross vortices, attract each other.

4. TheessenceofConductivityphenomena according the new Axioms and Laws

Figure 4.TheConductivity inordinary conductor

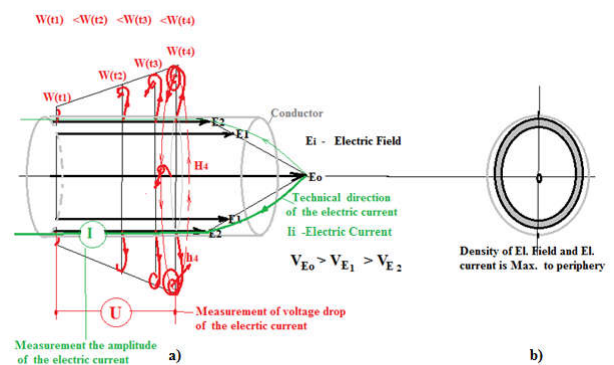


Figure 4.TheConductivity inordinary conductor

Results: (simple conductor)

With a simple conductor in the center, the electric field has maximum speed(V_{E_0}) because it has minimal resistance. In the outer cylinder, the electric field has a lower speed because the resistance is greater. Thus, at the periphery of the conductor, the cylinder of the electric field has a minimum velocity because it has maximum resistance in the cylinder at the boundary surface of the conductor.

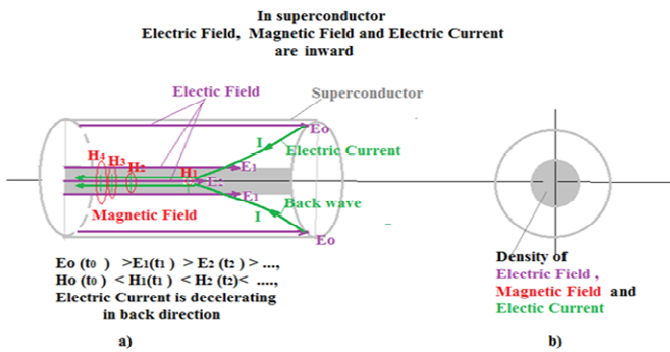


Figure 5. The Electric Current (I_i) is decelerating

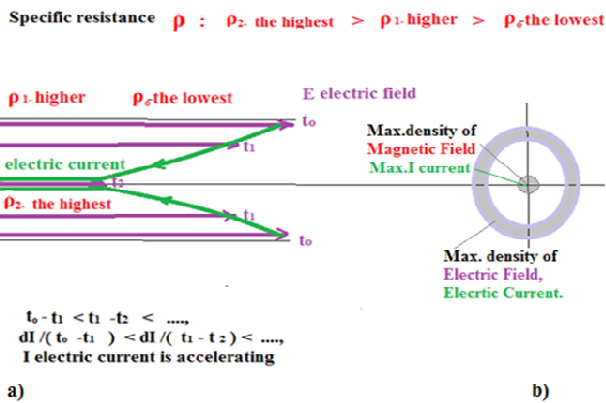


Figure 6. The Electric Current (I_i) is accelerating

- In the periphery of the conductor, according to Law 5, cross vortices (W_{ti}) are emitted from the conductor to environment. They release heat and increase the temperature of the space around the conductor. According to Law 5, these cross vortexes increase their amplitude in the direction of travel, so that at the end of the conductor and at the final time point, their amplitude is maximum.
- The difference between the final and initial amplitudes is proportional to the voltage drop. The voltage magnitude difference is measured with a voltmeter.
- The difference in speed causes the center of the Electricity field to appear first in time (t_0), then the field from the outer adjacent cylinder (t_1), etc., appears, and finally the field from the peripheral cylinder appears (t_n) (Figure 4a).
- Thus, in time, the so-called Back wave is obtained, which is interpreted by engineers as the Technical Direction of Electricity Current. If we sequentially place a measuring instrument, such as an ammeter, it will measure the amplitude of electricity current (I) in the opposite direction to the electric field (E) (Figure 4a).
- According to Law 1, every decelerating cross vortex emits an accelerating longitudinal vortex (h_i) from its center, such as an electron. For a decelerating electric field, both Law 1 and Law 5 apply. The electric field (E), due to the friction and resistance of the boundary surface, according to Law 5, generates decelerating cross vortices, which radiates outward from the conductor in the form of heat (defined by the right hand rule). These longitudinal vortices (h_i) form a wheel-closed vortex (H_i) in a direction corresponding to the delayed electric field. The

closed vortex direction (H_i) is to the left when viewed against the direction of motion of the electric field (E) and to the right if viewed against the direction of the electric current (I) (Figure 4a).

- Conductivity over a common conductor (for example, a copper conductor) is characterized by a maximum density of electrical lines to the periphery, where the velocity decreases to a minimum, and a minimum density at the center, where the velocity is maximum (Figure 4b).

5a. Construction of Superconductor with decelerating Electric Current (I_i) (Figure 5).

This kind of superconductor release heat in the center and does not conserve internal energy for a long time.

- The new approach will be such that the superconductivity design (Figure 5) should be inverse to the conductivity design (Figure 4). By this way it is possible to achieve superconductivity on normal temperature.
- In the case of a superconductor, the electric field (E_0) in the center, there should be a minimum speed because it must have maximum resistance. In the outer cylinder, the electric field (E_i) will have a higher speed because the resistance will be less. Thus, at the periphery of the conductor, the electric field cylinder (E_i) will have maximum velocity because it has minimal resistance.
- This effect can be achieved constructively by constructing the peripheral layer of the cylinder of the conductor from silver (Ag), which has a low specific resistance.
- According to Law 5, due to the friction and resistance of the material in the center of the superconductor, the Electric Field (E) generates delayed cross vortices, which radiates inward - in the form of heat. So in center the temperature will increase.
- According to Law 1, these delayed transverse vortices radiate from the center of the transverse vortex - outward accelerating longitudinal vortices (h_i) in the direction defined by the right-hand rule (Figure 2a, Figure 4a)
- These longitudinal vortices form a wheel-closed vortex (H_i) with increasing amplitude in a direction coinciding with the direction of the electric field (E_i). The closed vortex direction is to the left when viewed against the direction of motion of the electric field (E) and to the right if viewed against the direction of the electric current (I) (Figure 5a).
- The difference in velocities causes the Electricity field in the periphery to appear first in time (E_0), then- the Electricity field from the inner adjacent cylinder (E_i), etc., and finally the field appears in the center itself.
- This effect can be obtained constructively by incorporating a metal cylinder with a higher specific resistance in the center of the superconductor.

Results: (decelerating Back wave)

Thus, in time, the so-called decelerating Back wave is obtained from periphery to center, which is interpreted by engineers as the Technical Direction of Electricity (I).

- Unlike the direction of the electric current in a conductor that has a direction from the center to the periphery, the direction of the electric current in the superconductor will have a direction from the periphery

to the center. This is the reason that there will be no losses in the surrounding space. At the same time, the magnetic field is located in center of the conductor and there is no radiation outside.

- The fact that, the electric field (E), the magnetic field (H), and the electric current (I) propagate inside the conductor is the reason for the absence of energy loss in the form of radiation (Figure 5a, Figure 5b).

Results: (Conductivity in a Super conductor)

The Conductivity in a common conductor (for example a copper conductor) is characterized by a maximum density of electrical lines to the periphery, where the velocity decreases to a minimum, and a minimum density - in the center, where the velocity is maximum (Figure 4).

- The Conductivity in a Super conductor (for example a silver in periphery and for example an alloy "cantaloupe" in center) is characterized by a maximum density of electrical lines to the center, where the velocity decreases to a minimum, and a minimum density - in the periphery, where the velocity is maximum (Figure 5).

5b. Construction of Superconductor with accelerating Electric Current (I_i) (Figure 6)

- Technological construction of the superconductor is done by gluing several (minimum of 3 pipes) incorporated and nested into each other with different resistances R (or specific resistances ρ_i).
- For example, the most peripheral tube will be of silver, the inner one -of copper and the innermost one -of cantaloupe.
- Because the Electric field (E) is very delayed to the center, it emits cross vortices and forms the magnetic field (H). It is concentrated in the center and therefore there is no loss. Electric current (I) is accelerated in the center and it does not release heat and loss.

Results: (Minimum resistance (metal-silver) in the periphery).

This kind of superconductor does not release heat in the center and it conserves internal energy for a long time.

- In this kind of superconductor, the electric field (E_0) in the periphery, there should be a maximum speed because it must have minimum resistance (metal silver). In the inner cylinder, the electric field (E_1) will have a lower speed because the resistance will be bigger. Thus, at the periphery of the conductor, the electric field cylinder (E_i) will have maximum velocity because it has minimal resistance.
- This effect can be achieved constructively by constructing the peripheral layer of the cylinder of the conductor from silver (Ag), which has a low specific resistance.

Results: (high resistance of the material in the center)

- According to Law5, due to high resistance of the material in the center of superconductor, the Electric Field (E_i) generates decelerating cross vortices to

outside. They are radiated in the center in the form of heat.

- So in center the temperature will increase. According to Law 1, these delayed transverse vortices radiate from the center of the transverse vortex - outward accelerating longitudinal vortices(h_i) in the direction defined by the right-hand rule. These longitudinal vortices form a wheel-closed vortex(H_i)with increasing amplitude in a direction coinciding with the direction of the electric field (E_i). The closed vortex direction is to the left when viewed against the direction of motion of the electric field (E) and to the right if viewed against the direction of the electric current (I) (Figure 2a, Figure 4a).
- The difference in velocities causes the Electricity field in the periphery to appear first in time (E_0), then- the Electricity field from the inner adjacent cylinder (E_i), etc., and finally the field appears in the center itself. This effect can be obtained constructively by incorporating a metal cylinder with a higher specific resistance in the center of the superconductor.
- According to Law 6, due to accelerating moving of Electric Current (I), it will suck in the free cross vortices that have been previously emitted.
- According to the Law 3 and Law4 this Electric Current (I) accelerate itself more and more Results:(accelerating electric current)
- The accelerating Back wave is obtained from periphery to center, which is interpreted by engineers as the Technical Direction of Electricity(I). -The direction of the electric current in a conductor has a direction from the center to the periphery. The direction of the accelerating electric current in the superconductor will have a direction from the periphery to the center. This is the reason that there will be no losses in the surrounding space. The magnetic field is located in center of the conductor and there is no radiation outside.
- The described Superconductor is characterized by a maximum density of electrical field (H) to the periphery, where the velocity is maximum, and by a minimum density - in the center, where the velocity is minimum (Figure 6a).
- The reason for the absence of energy loss in the form of radiation is the fact that, the electric field(E), the magnetic field (H), and the electric current(I) propagate inside the conductor is the reason for the absence of energy loss in the form of radiation (Figure 6b).

Conclusion

The second construction is better because it is done so that the mass and energy of cross vortices will add to the flow of accelerating Electric Current (I) and will increase it more and more.

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