Difference between Electromagnetic and Gravitational Field According New Axioms and Laws

Valentina Markova*

Bulgarian Academy of Sciences

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

Abstract

It is known that the Electromagnetic field propagates as a transverse wave with a constant speed. The external manifestation of the Electromagnetic field is perfectly described by Maxwell's equations in 1864. In the Classical Theory of the Electromagnetic field, all the equations refer to motion or rotation at a constant speed. They obey one Classical Axiom which states that rotation of vector E with constant speed forms a closed circle. Motions or rotations with variable speed or with monotonically variable speed are not considered.

This new type of non-uniform motions is considered by the Theory of new Axioms and Laws. This Theory is proposed by the author. The first new Axiom states that a rotation of a vector E with a monotonically varying speed forms an open circle or vortex. Vortices can be in a plane (2D) and are called transverse vortices, or in a volume (3D) and are called longitudinal vortices . Each of these two types can be accelerating or decelerating. Thus, the Theory of new Axioms and Laws describes 4 types of movements instead 1 type by the Classical field Theory. The full Theory of new Axioms and Laws includes 2 axioms and 8 laws. This article uses 2 Axiom and only 4 Laws.

The previeus articles describe exactly this that the longitudinal accelerating and decelerating vortices create Gravitational waves. The reason is that longitudinal accelerating vortices are attracted and packed into accelerating Funnels. They suck transverse waves with acceleration from outside-in and simultaneously with rotational motion to the left (if the observer is looking against the movement). The central part of accelerating Funnel continues as longitudinal accelerating vortex that looks like the energy much more than the matter. Thus accelerating Funnels transform some of the transverse motion (vortices) into longitudinal or transform some of the matter into energy.

Decelerating longitudinal vortices are packed into decelerating Funnels. They repel decelerating transverse vortices inside-out and simultaneously with a rightward spin (if the observer is looking against the movement). Thus the decelerating Funnels transform longitudinal motion (vortex) into transverse, or part of the energy into matter.

The observation shows that there is a huge Space distortion outside (around) and inside the Gravity Funnels. But analysis shows that the cause of this Space distortion is the presence of acceleration -positive or negative. Therefore the cause is the presence of acceleration but the result is the observation for a distortion of Space.

1. Introduction

The Classic Axiom states that movement of a vector with constant speed always form closed loop [1]. This statement idealized the nature of the electromagnetic field, but for the purposes of theory and practice at the time it was very appropriatehis. This Classic Axiom becomes a base of ideal description of Electromagnetic field. It discribes Electromagnetic field as waves moving with constant velocity (Figure1a). In this article is used invented by the author aTheory of new Axioms and Laws which consists 2 new Axioms and 8 Laws. In this article is used 1 new Axioms and onky 4 new Laws [2-4].

New Axiom 1: It states that the movement of a vector with a variable speed (monotonically decelerating or monotonically accelerating) always forms an open vortex.

The result in 2D is that we get a decelerating transverse or accelerating transverse vortex. And in 3D - we get a longitudinally

decelerating or longitudinally accelerating vortex. Therefore instead of 1 movement (according Classical Axiom) we get 4 types of movements as vortices in 2D and 3D. The other result is that the open vortex is always eccentric. The center of eccentric is not in Geometric center, but it is replaced in so called Gravity center (Figure1b).

New Axiom 2: A pair of two orthogonal vortices exists in the same Time and Space as exchange matter and energy in resonance system.

For example proton emits matter to electron which emits energy to proton in resonance.

Law 1 for the electron: It states that a transverse decelerating vortex from the outside-in in plane 2D generates in its Gravity center a longitudinal acceleration vortex in volume 3D which is perpendicular to plane 2D. An example of an open decelerating transverse vortex in 2D is an electron with Gravity center in second quadrant (Figure1b) [4].

Law 2 for proton: It states that a longitudinal decelerating vortex in volume (3D) generates accelerating transverse vortex in plane (2D) from Gravity center to outward. The example for the open accelerating transverse vortex is an proton with Gravity center in first quadrant (Figure1c) [2-4].

Law 5 for 2D: The main decelerating vortex (in 2D) has decreasing longitudinal velocity (V) and emits outward many primary decelerating vortices with increasing amplitudes (W), where at every i-th step the variable is changed by a degree of the parameter ψ (ψ^1) and ψ is equal to the Golden proportion (Figure 1d) [5, 6].

Law 5 for 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: $V^2 = V_0 (1 +V)$,

$I\ V^2 = V_0 (1 +V),$
$I\ W^2 = W_0(1 -W),$
$I\ w^2 = w_0 (1+ w),$
$I\ N^2 = N_0 (1+ N).$

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 nn 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: $\psi-1/\psi =1$, ψ is known as Golden ratio.

In Space where we live the most movements are decelerating. The reason is that the transverse vortices have density and their some kind of mass. The result is that this Space is full of transverse vortices and they exerts resistance. The correspondng Space-Time is described by constant of Time (as a proportion).

Law 6 for 2D: The main accelerating vortex (in 2D) has increasing longitudinal velocity (V) and sucks inward many primary accelerating vortices with decreasing amplitudes, (W), where at every i-th step the variable is changed by a degree of the parameter (ψ_i) and ψ is equal to the Golden proportion, (Figure 1e) [6, 7].

Law 6 for 3D: 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: $V^2 = V_0 (1 - V),$

$I\ V^2 = V_0 (1 - V),$
$I\ W^2 = W_0(1 +W),$
$I\ w^2 = w_0 (1+ w),$
$I\ N^2 = N_0 (1+ N).$

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 N0 is starting value of n_n;** ψ is a proportional that fulfills the requirement: $\psi-1/\psi =1$, where ψ is Golden ratio.

From previous publications a very useful conclusion has been drawn that in Space out of Earth live the most movements are of longitudinal vortices .But they are not decelerated. but they are even accelerated The reason is in qualities of longitudinal vortices and lack of matter in Space and the result is lack of resistance.The correspondng Space-Time is described by constant of path (as a length of spiral).
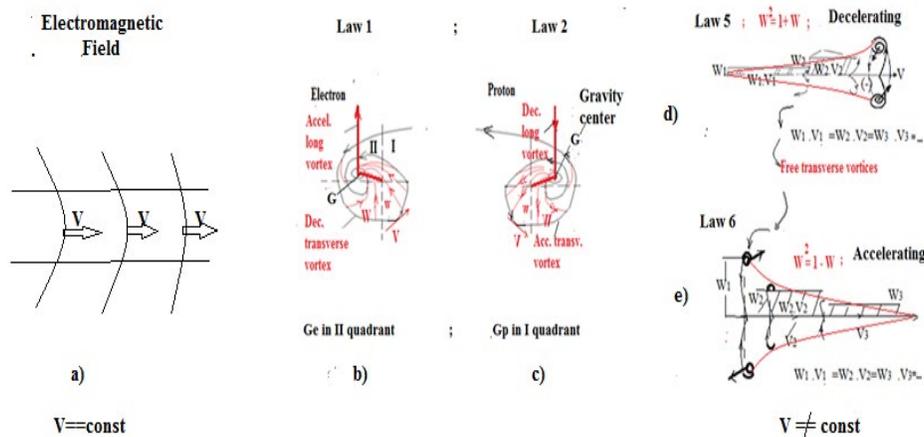
Figure 1: Description of Law 1, Law 2, Law 5 and Law 6

2. Comparison
A) About the Classical Electromagnetic Field
The Electromagnetic field was perfectly described by Maxwell as early as 1864 [1]. Maxwell laid the foundation of Laws and the Theory of the Electromagnetic field with one basic Axiom. In general terms, it states that the movement of a vector (E) in a closed circle is carried out at a constant speed (V=const). From this foundation on, all Laws of Maxwell refer to motion at constant velocity.And also Laws of Electrmagnetic field refer only to motion at constant velocity (V=const) (Figure1a) [1].

Actually in the internal structure of the Electromagnetic field also has vortices with positive and negative acceleration. They are result from resistance to the boundary surfaces. But these cases are not considered and are not included by the Classical field Theory. It describes and analyzes only the external appearance of the Electromagnetic wave as wave with motion in constant speed . It does not deepens to the internal level to the internal structure of the wave and intrnal forces . Thus it does not study the moving forces and causes, does not answer very basic questions : of who moves ,who executes, what are the connections etc.

In the distance from the 19th century to the 21st century, many attempts were made to insert and describe the Gravitational field through the Classical knowledge for Electromagnetic field. But the attempts were unsuccessful.

B) About the Theory of New Axioms and Laws
The first new Axiom1 states that the movement of a vector in an open circle is carried out with variable speed. In particular, if the speed changes monotonically (increasing or decreasing), then the open circle turns into a vortex. If the speed is monotonically increasing, then the vortex is accelerated. If the speed is monotonically decreasing, the vortex is decelerated. If the vortex is in a 2D plane, it is called a transverse vortex. If the vortex is in a 3D volume, it is called a longitudinal vortex.

Therefore in this way is obtained 4 (instead 1) different movements: decelerating and accelerating transverse vortices and decelerating and accelerating longitudinal vortices [2-4].

Result: We obtain 4 different movements in 2D and in 3D. This is a larger base for the Theory of the new unknown fields, including the Gravity field.

C) About the Gravity Field and the Comparison
The conclusions which are described bellow follow quite naturally and logically from the new Theory of New Axioms and Laws.

The main reason for the qualitative difference between Electromagnetic and Gravity field is that the Electromagnetic field spreads as transverse waves in 2D (Figure 1a), but the Gravitational field is spread as longitudinal vortices in 3D (Figure 3a,b) [6-8].

Result: The difference is that the Electromagnetic field spreads as transverse waves (with constant speed), and the Gravitational field -as longitudinal vortices (with variable speed).

But (attention!) only longitudinal vortices are srived to insert one into other and form packages in form of tube (Funne l) (Low 5, Low 6).

The longitudinal vortices (accelerating or decelerating) take part in the new Gravity field described by new Axioms and Laws. The transverse vortices (accelerating or decelerating) also take part in new field described by new Axioms and Laws. .But they do not make packages of form of Funnels.

Result: The longitudinal vortices (accelerating or decelerating) make Funnels by inserting one into other the longitudinal vortices with different speed.

According Axiom 2 transverse vortices form pairs of orthogonal transverse vortices (Figure b,c). For example: they form the pair of a vortex of electron and the vortex of proton [18].

The Electromagnetic field as external structure is consisted by transverse vortices which propagate at a constant speed (without acceleration) speed [1]. But because of friction in boundery surfaces as internal structure this vortices can be decelerating or accelerating speed [2-4].

Result: The transverse vortices has zero acceleration and do not make Funnel, but make pair of orthogonal transverse vortices as pair of orthogonal particles.

The Gravitational field is consisted by longitudinal vortices packed in tubes (Funnels) they all are accelerated or decelerated i.e. all of them move is with variable speed [7-9].

Result: The Gravitational field consists longitudinal vortices (accelerating or decelerating) packed in Funnels.

Conclusion: The difference between Electromagnetic and Gravity field is the lacking of the acceleration in Electromagnetic field and existing of acceleration in Gravity field.

These above results follow quite naturally and logically from the Theory of New Axioms and Laws.

3. Description of the Decelerating Longitudinal Funnel
A) Description of Spirals in Decelerating Funnel
According to Law 5, the main decelerating vortex with decreasing

velocity (V) emits decelerating primary vortices to the surrounding Space with increasing amplitudes (W) (Figure1d) [7-9].

Because of friction of decelerating primary vortices to environment the main decelerating vortex is delayed even more. As less is a longitudinal speed (V) as longer are amplitudes (W) of the transverse emitted vortices. And inverse - as more is a longitudinal speed (V) as shorter are amplitudes (W) of the transverse emitted vortices (Law 5) [7-9].

This is the reason the longitudinal decelerating vortex which has greater velocity (V1) (shorter primary emitted vortices) and less radius (R) to insert inside a longitudinal decelerating vortex of lower velocity (V2) and larger radius (R). This occurs like the faster vortex (V1) is inserted into the center, and the slower vortex (V2) is coiled on the outside and they make some kind of package. The reason is that the longitudinal decelerating vortex with lower velocity (V2) is that has shorter transverse (W1) vortices than the slower vortex (W2): W1<W2. This means than the slower vortex sucks to inside the faster vortex (Figure 2a).
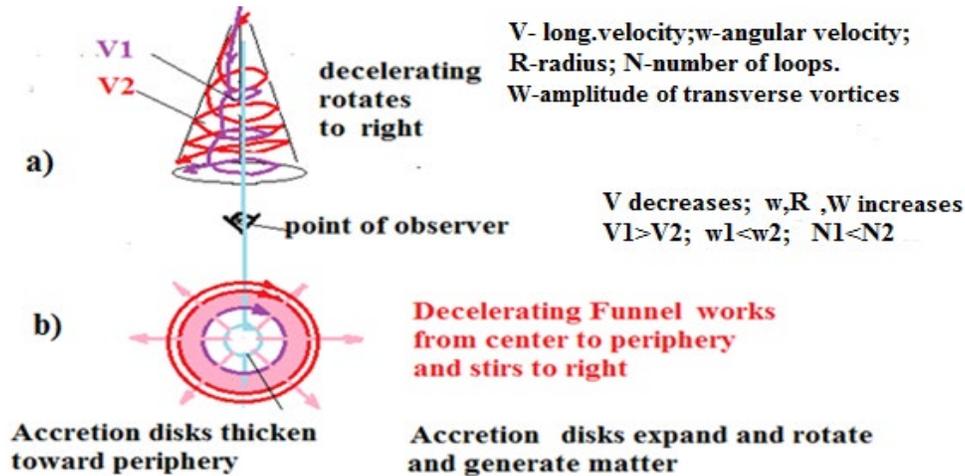

Figure 2: Decelerating Funnel: Decelerating spiral rotates to right in Time (while accelerating spirsl rotates in Time to left)

Result: The reason a longitudinal decelerating vortex with more velocity to insert inside the longitudinal decelerating vortex with lower velocity is that the faster vortex has shorter transverse vortices and radius than the slower vortex.

This package may contain not only two but many more longitudinal decelerating vortices with different longitudinal velocities and negative accelerations.In such way is formed a longitudinal decelerating Funnel (Figure 2a).

Result: The decelerating longitudinal vortices forme an unique longitudinal decelerating Funnel.

Therefore the structure of decelerating Funnel is that in the center of the Funnel inserts the longitudinal vortex with maximum longitudinal speed (Vmax) and minimum number of windings (Nmin), minimar radius (Rmin) and the primary transverse vortices with minimal length (Wmin). But in the periphery, the longitudinal

vortex is wound with minimum speed (Vmin) and maximum number of windings (Nmax) and maximal radius (Rmax) and the primary transverse vortices are with maximal length (Wmax) (Figure 2a).

The outer (peripheral) spirals not only have a larger radius in Space, but simultaneously they also expand in Time in the direction from the beginning to the end of the Funnel. The decelerating spiral and decelerating Funnel in Time rotates to right (if observer is opposite the moving) [10-12].

Result: The decelrating longitudinal Funnel expands from inside -out and simultaneously is rotated to right (if observer is opposite the moving).

The radius of the decelerating Funnel increases (to maximal), the transverse velocity of the peripheral vortex increases as well. It seems like the decelerating Gravity Funnel emmits primary

transverse vortices to outside. Actually the primary transverse vortices generate primary form of matter in direction from inside-out [12-14].

Result: The decelerating Gravity Funnel generates primary matter to the surrounding Space outwards. The Funnel acts so that it works pushing and expanding its radius decelerated outward also in non-linear mode. At the same time it rotats the primary matter outward its radius.

Result: The emitting outward and rotating to right the decelerating Funnel is also is in decelerated non-linear mode.

This means that the negative acceleration decreases with a positive increasing step (Law 6).

For example: If the starting longitudunal velocity is V1, the first velocity is $V1:(\psi^1)$, then the second velocity will decrease to $V1: (\psi^2)$, the third velocity is much less $V1:(\psi^3)$ and so on to n-th velocity which is minimal $V1:(\psi^n)$, where ψ is the Golden proportion equals approximately to 1,62.

If the starting amplitude is W1, the amplitude of the first emitted vortex is $W1. (\psi^1)$, then the second amplitude will increase to $W1. (\psi^2)$, the third amplitude is much more $W1. (\psi^3)$ and so on to n-th amlitude which is maximal $W1.(\psi^n)$, where ψ is the Golden proportion equals approximately to 1,62.

If the Funnel consists of several decelerating spirals their diameters are also increase decelerating. This means that in cross section decelerating diamerers will form condenced circles with decreasing distance between them.The decelerating rate of increase in the amplitude of the transverse vortex of the Funnel means that the increasing of radius of the Funnel is also non -linear decelerated.

Result: The increasing of radius of the decelerating Funnel is also non -linear decelerated.

The circles of cross section of decelerating Funnel form so called Accretion Discs. They represent concentric circles with decreasing distance between them in direction from center to the periphery of Funnel (Figure 2b).

Result: The Accretion Discs are concentric circles in cross cection of decelerating Funnel with decreasing distance between them in direction center -out.

It is well known that the non-linear distribution around an object as the Funnel distorts the Space.

Result: The uneven non-linear distribution of decelerating Accretion Disks distorts the Space inside and outward of the decelerating Funnel.

But it is obviously that the Funnel expands non-linearly as well

(Figure2b). The reason for distortion of Space is the non-linear acceleration with which the primary matter is radiated from inside the Funnel to the Space around.

Conclusion: The non-linear negative acceleration of decelerating Funnel in the reason and the distortion the Space inside and around the decelerating Funnel is only one of result .It has form of decelerating Accreation Disks in direction center-out.

The scientists observe these Accretion wheels and make conclusions about the magnitude of the negative acceleration.

B) Hight-Frequency Modulation in Decelerating Funnel

All spirals involved in the decelerating Funnel pulsate at a very high frequency (not known). This high frequency is both amplitude and frequency modulated on the carrier spiral. Therefore, the spiral in center, which is almost straight will pulsate both in width (amplitude) and in length (frequency).

In the central vortex, the frequency modulation (along length) is much more significant then amplitude (in width). The sharp contraction of the length of the longitudinal spiral means the sharp decreases of longitudinal velocity. This is the reason to emit the primary transverse vortices around (Law 5). This is the reason that the Space inside the decelerating Funnel is saturated with primary longitudinal vortices in direction from in to out.

Result: Due to high-frequency modulation, the vortex in center emits out of itself primary transverse vortices as fills and expand the internal space of Funnel.

In the peripheral vortex, the amplitude modulation (in width) is much more significant than frequency modulation (along length). The sharp contraction (in width) of the radius of the peripheral vortex attracts each outer layer. The starting outer layer lags a little (d) and arrives at time t0. The first outer layer lags more (d.)) and arrives at time t1. The second outer layer lags even more (d. (ψ^2)) and arrives at time t2. The third outer layer lags even more (d.(ψ^3)) and arrives at time t3. And so on. to the n-th layer, which lags behind the most and arrives in time tn, where (ψ) is Golden proportion. If we connect t0, t1, t2, t3, etc., we will get a reverse transverse wave orso called **Back wave** in the opposite direction of the initial longitudinal-transverse vortex.

Result: Due to low viscosity and high friction, the outer layers lag behind each other in Space and form a reverse Back wave in Time.

But the most curious effect is that although the outer layers move decelerated (due to friction) the reverse Back wave move accelerated. The special thing is that this acceleration is not in Time, but in Space.

The reason is that in every next layer the viscosity decreases. The result is that the delay increases in Space (not in Time). Therefore the Back wave turns out to be accelerating in Space (not in Time) [8,9].

Result: The return Back wave is accelerating in Space (not in Time). The reason is that in each subsequent layer the viscosity decreases and each subsequent outer layer lags more and more. Therefore, on the return trip for the Back wave, this increasing lag becomes an increasing acceleration. The Back wave becomes an accelerator for the Space of N layers in the direction from the center to the periphery.

4. Description of the Accelerating Longitudinal Funnel
A) Description of Spirals
According to Law 6, the main accelerating vortex suck many accelerating primary vortices from the surrounding Space and thus it accelerates even more (Figure1c) [6, 7]. The faster longitudinal vortex sucks and has much shorter transverse vortoces than the slower longitudinal vortex This is the reason that a faster longitudinal accelerating vortex with a higher longitudinal speed sucks a longitudinal accelerating vortex with a lower speed. Therefore the faster inserts inside the slower. This happens as the faster vortex is inserted into the center and the slower vortex is wound on the outside. This act forms some kind of package which can contain not only two but many more longitudinal vortices with different longitudinal velocities.In the center of the Funnel is the longitudinal vortex with maximum longitudinal speed and acceleration of the longitudinal movement and minimum transverse speed of the transverse vortices.

In the periphery of the Funnel the longitudinal vortex is wound with minimum speed and acceleration and maximum number of windings of the transverse vortices.

Result: It is formed the acceleration Gravity Funnel as the longitudinal vortices are inserted into each other and suck from the outside toward itself primary transverse vortices in form of primary matter.

Result: For the longitudinal vortex in center the radius of the spiral decreases and the transverse (rotating) velocity decreases to zero. Or the fastest central vortex almost frozes (it stops to rotate) It moves only longitudinally. So that the Funnel works by sucking and shrinking inward and decreasing of its radius. The suction inward by the accelerating Funnel is also accelerating and non-linear.

Result: The positive acceleration increases with a positive step or sucking is also non-linear.

For example: If the starting velocity is V1, the first increasing velocity is V1. (ψ^1) and the second velocity increases to V1. (ψ^2), the third velocity increases much more to V1. (ψ^3) and so on to n-th velocity equal to V1. (ψ^n), which will be maximum, where f is Golden Proportion (approximately 1.62) (Figure 1c).

If the starting amplitude of sucked transverse vortex is W1, the first sucked vortex is W1:(ψ^1) and the second amplitude will decrease to W1: (ψ^2), the third amplitude is W1: (ψ^3) and so on to n-th amlitude equal to W1: (ψ^n), which will be almost zero,where (ψ) is Golden Proportion (approximately 1.62) (Figure 1c) [8-10].
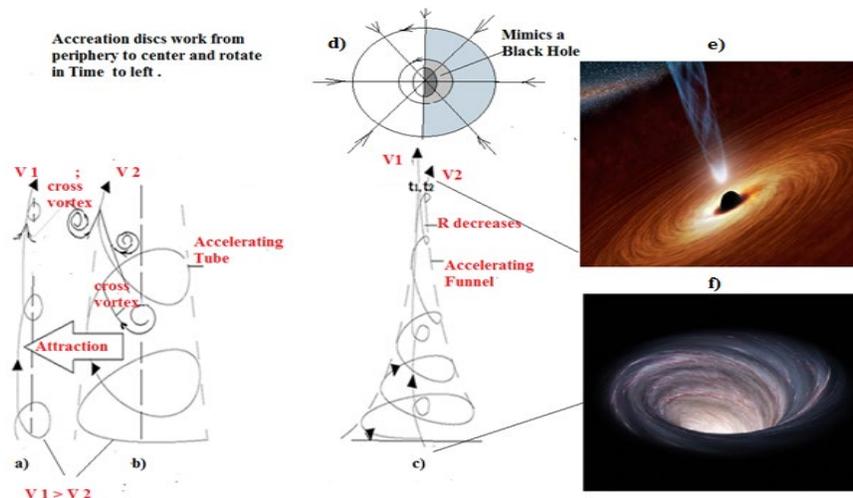

Figure 3: The longitudinal Funnels: How fastest longitudinal vortex (V1) (Figure3a) attracts slower longitudinal vortex (V2) (Figure3b) and inserting in center form the accelerating Funnel (Figure 3c), (Figure3d) describes decelerating Accretion Disks, (Figure3e) describes longitudinal vortex, (Figure 3f) describes accelerating Accretion Disks

We saw that the diameter of the Funnel is decreases also non-linearily (Figure 3d, Figure 3e)

Result: The non-lineal decreasing in the amplitude of the transverse vortex of the Funnel means that the diameter of the Funnel is similarly decreases or non-linearily.
It forms accelerating Accretion Disks as concentric circles (Figure 3f)

Result: The Accretion Disks are concentric circles with decreasing distance in direction from periphery to the center of Funnel.

The uneven non-linear distribution of Accretion Disks distorts the Space around the accelerating Funnel.

Result: The Space shrinks non-linearly and it causes distortion of Space.

Therefore the reason for distortion of Space is is the non-linear acceleration with which it sucks the space around [11, 12].

Conclusion: The reason for distortion of the Space is non-linear acceleration of accelerating Funnel, the result is distortion the Space as accelerated decreasing radius in direction to the center the Accretion Disks.

B) Hight-Frequency Modulation in Accelerating Funnel
All the spirals involved in the accelerating Funnel should be pulsate with a very high frequency (unknown). This high frequency is both amplitude and frequency modulated on every the carrier spiral. Therefore, the carrier spiral in center which is almost upright will pulsate both in width (amplitude) and in length (frequency). Because the radius of loops (R) and number of loops (N) is almost zero, in width (amplitude) modulation is also almost zero.

Therefore for the vortex in center, the length (in frequency) modulation is much more significant than the radius modulation (in amplitude). The sharp impulse contraction along the length of the longitudinal spiral interupts and tears up in dashes the upright longitudinal spiral. Therefore central spiral will emit so called primary longitudinal vortices over it. This is the reason that the Space over the accelerating Funnel is saturated with primary longitudinal vortices that look like of bundles of arrows. They are packed in bundels which very soon dispack and disperse to around.

Result: Due to high-frequency modulation, the vortex in center emits and fills the surrounding Space with primary longitudinal vortices.

In the peripheral vortex, the amplitude modulation (in width or in radius) is much more significant then frequensy modulation (along length). We already know that the peripheral vortex is maximally wound. This is the reason that the number of loops (N) and the radius (R) of the loops are maximum. Therefore, in the peripheral vortex, the high-frequency width-amplitude modulation of the radius (R) and number of loops (N) are more visible than the length-frequency modulation.

We already also know that due to friction in the environment, the peripheral vortex reduces its speed to a minimum and then reverses the direction of movement, forming a reverse Back wave. But this phenomenon is accompanied by high-frequency modulation, such that the Backwave is interrupted or tear into peaces impulsively. Therefore, the Back wave will not be continuous but it will be tear or broken into impulces of sprays and eddies The back wave will emit transverse primary vortices by impulsing to environment [14, 15].

Result: The high-frequency modulation of peripheral vortex form the Back wave radiates impulses transversely and fills a space in the periphery with transverse primary vortices.

This is the reason the end of the Funnel to be more expand than the start.

5. Properties
A) Longitudinal Vortices are Invisible to an Outside Observer
The reason for that the longitudinal vortices are invisible to an outside observer is that there is a qualitative difference between the light wave and the longitudinal vortex. The light wave is transverse and moves transversely to the direction of motion, and the longitudinal vortex has a longitudinal wave and twists longitudinally along the direction of motion.

The reason of process of invisibility is as follows: The transverse light wave reaches the longitudinal thread of the longitudinal vortex. Then the light wave crosses the longitudinal thread, but is not reflected by it. The reason is that the thickness of the longitudinal thread is incommensurately smaller than the wavelength of the light wave.

Result: The longitudinal vortex is invisible because the light wave as transverse vortex surrounds the thread of longitudinal vortex.

Therefore the light wave is not reflected but goes around the thread and continues in the previous direction and with the previous speed. This reaction is known and defined as diffraction [7,11,14].

Result: The longitudinal vortex is invisible because light wave continues in the previous direction and with the previous speed.

This described reaction is known and defined as diffraction [7,11,14].

Result: The longitudinal vortex is invisible because light wave (as transverse wave) does not reflect. It make difraction around the thread of longitudinal vortex.

B) Decelerating and Accelerating Funnels from Longitudinal Vortices are also Invisible
Diffraction is the reason why Funnels from longitudinal vortices are also invisible

For example: The transverse link between the proton and the electron is invisible. The reason is that the transverse link with direction from the proton to the electron represents a longitudinal Funnel which first accelerates after -decelerates. The longitudinal bond between the electron and the proton is also invisible. The reason is that the longitudinal connection (in the opposite direction from the electron to the proton) also represents a longitudinal Funnel which first is accelerated then is decelerated [8, 10].

We saw that the effect of invisibility is the result of diffraction of a transverse light wave around the thread of longitudinal vortex. If this light wave is modified, perhaps a denser Funnel can be seen, albeit as a silhouette or shadow. Such modification can be light polarization, frequency or phase modulation or etc.

C) A new Space-Time in Decelerating Funnel is Formed with Constant Path along the Spirals Inserted one into the other: S=Const.

A new type of Space-Time is formed inside the Funnel. The longitudinal vortices self-organize so that they arrange themselves inside the Funnel, according to the differences in their longitudinal velocity (V), which covers the longitudinal path in time (T). Also it has a precisely defined transverse (angular) velocities(W) and precisely number (N) of transverse loops [9].

Result: The longitudinal vortices self-organize so that they arrange themselves inside the Funnel, according to the differences in their parameters: longitudinal velocity (V) angular velocity (w), amplitude of primary transverse vortices (W), nuber of loops (N).

In the center is the fastest longitudinal vortex with a maximum longitudinal speed (Vmax). It covers the spiral road in minimal time (Tmin). This is occured because the central longitudinal vortex straightens by obtaining a minimum number of loops (Nmin) with minimum radii (Rmin), in which the vortex along loop should have a minimum angular velocity (w min). In center Tmin=F(Nmin,Rmin,w min), where F is complex non-linear function. Because the longitudinal vortex straightens is the reason the path along the the spiral to stay constant: S=Vmax.Tmin=const.

Result: The central longitudinal spiral vortex has maximal velocity (V) and minimal number of loops (N) and is therefore almost upright.

Result: The central spiral experiences almost no resistance from the material environment and passes through it as if through a transparent medium.

Outside of it is the adjasent slower vortex with an average spiral velocity (Vav) which covers the road in average time (Tav). In the same timei It has an average transverse angular velocity (w av) with an average number of transverse loop (Nav). This occurs so the path of this comparatively more coiled spiral is also to be equal the previous constant: **S=Vav.Tav.** = const.

For example: Let's imagine a spring that we stretch and contract in length. When the spring is stretched, it has a small number of loops with a smaller radius. Therefore the central spiral is maximum crucified, but the peripheral spiral is maximal rolled up.

When the one and the same spring coiled it has a larger number of loops with a larger radius. But the length is the same because it is one and the same spring in a different stretched state [9].

Conclusion: The inner and outer spirals in a Funnel have the same length because they represent the one and the same spiral in different stretched states.

In the periphery is coiled the slowest vortex with smallest spiral velocity (Vmin). It covers the spiral path in maximal time (Tmax). This is occured because the spiral vortex is maximal coiled with a maximal number of loops (Nmax) with maximal radii (Rmax), in which the vortex must travel with a maximal angular velocity (w max) Therefore: Tmax=F (Nmax, Rmax, w max). When longitudinal velocity (V) is minimum, angular velocity (w) is maximum and radius (R)is maximum as well.

We saw that in periphery the spiral vortex is much coiled with many in number and large loops. (In center the spiral vortex has long but straight path almost without loops). This is the reason the path along the periphery spiral to be equal to the path of central spiral. This means that the path remains the same constant, it is equal to the previous and to more previous constant: **S=Vmin. Tmax = const.**

Result: The peripheral vortex is highly coiled and highly retarded and emits primary vortices to the surroundings.

The most important is that this peripheral longitudinal vortex posses the largest transverse angular velocity (w max) with the largest radius (Rmax). This means that it acts like a stirrer .For example: by this way the proton particle is generated as stired in vacuum.

Result: The peripheral spiral experiences large resistance from the material environment and acts in denser medium like a stirrer.

The peripheral vortex has a maximum accelerating angular velocity generating a maximum radius (Rmax). That is the reason the periphery spiral to act as a mixer in a denser medium.

According new Axioms and Laws the material particle is made by transverse vortex. This is the reason (Law 2) the longitudinal peripheral vortex to generate a transverse vortex just as material particle. According Law 2 the decelerating lingitudinal vortex generates accelerating transverse vortex from center to oward.

Result: The peripheral decelerating vortex through the maximal angular velocity (w) generates elementary particle proton.

According Law 2. the longitudinal vortex generates the transverse vortex of the material particle proton from center to outwars.

Conclusion: The longitudinal decelerating Funnel transforms part of Energy (from center) to matter (to periphery to outward), generating material particles in vacuum.

D) A new Space-Time in Accelerating Funnel is Formed for Constant path of the Spirals Inserted one into the other : S=Const.

As and in decelerating Funnel, a new type of Space-Time is formed inside the accelerating Funnel. The longitudinal vortices self-organize so that they arrange themselves inside the Funnel, according to the differences in their spiral velocity (V), which covers the spiral path in time (T). Also it has a precisely defined transverse (angular) velocities (W) and precisely number (N) of transverse loops.

As in decelerating Funnel in the center of accelerating Funnel is inserted the fastest longitudinal vortex with a maximum spiral speed (Vmax). It covers the spiral road in minimal time (Tmin). This is occured because the central longitudinal vortex is straighten to a sraight line. This is made by obtaining a minimum number of loops (Nmin) with minimum radii (Rmin), in which the vortex along loop should have a minimum angular velocity (w min).

Therefore: Tmin=F(Nmin,Rmin,wmin), where F is complex non linear function. The longitudinal vortex in center is straighten and it is the reason the path along the spiral to stay constant: **S=Vmax. Tmin**=**const**.

Result: The central longitudinal acceleraing vortex is further accelerated by sucking in primary accelerating vortices (Law 6) and for this it is fully upright.

Result: The central accelerating longitudinal spiral reaches speeds greater than the speed of light because it experiences no resistance from the medium.

Outside of center is rotated an adjacent slower spiral vortex with an average spiral velocity (Vav) which covers the road in average time (Tav). In the same time it has an average transverse angular velocity with an average number of transverse loop. This occurs so the path of this comparatively more coiled spiral is also to be equal the previous constant: **S=Vav.Tav**. = **const**.

In the periphery is coiled the slowest vortex with smallest spiral velocity (Vmin). It covers the spiral path in maximal time (Tmax). This is occured because the spiral vortex is maximal coiled with a maximal number of loops (Nmax) with maximal radii (Rmax), in which the vortex must travel with a maximal angular velocity (w max) Therefore: Tmax=F(Nmax,Rmax,Wmax). In periphery the spiral vortex is much coiled with many and large loops. In center the spiral vortex has long but straight path almost without loops. This is the reason the path along the periphery spiral to be equal to the path of central spiral. This means that the path remains the same constant, it is equal to the previous and to more previous constant:
S = Vmin. **Tmax= const**.

Let's imagine a spring that we stretch and contract in length. When the spring is stretched, it has a small number of loops with a smaller radius. When the same spring is coiled it has a larger number of loops with a larger radius. But the length is the same because it is the same spring in a different stretched state [16-19].

Conclusion: The inner and outer spirals in a accelerating Funnel have the same length because they represent the one and the same spiral in different stretched states.

The most important is that this peripheral longitudinal vortex posses the largest transverse angular velocity (Wmax) with the largest radius (Rmax). This is the reason the peripheral vortex will exert maximal friction against the environment. Therefore it will

begin to lag more and more and finally reverse in the opposite direction. Thus a reverse wave is formed which is lagging behind and is in the opposite direction to the accelerating peripheral wave.

Result: The periphery longitudinal spiral of accelerating Funnel makes a Back wave because of friction it changes its acceleration from positive to negative.

The difference between velocity of layers of Back wave decreases and this is the reason this Back wave to seem decelerating [8-10].

Result: The Back wave is decelerated in direction from end to the beginning.

The shape of a decelerating Funnel resembles an arrow as in start is expanded but at final end is a point As in decelerating Funnel and in accelerating Funnel the relative fastest vortex (Vmax) is in the center and arrives first in time (Tmin). The relative slowest vortex (Vmin) coils in the periphery and arrives last in time (Tmax). It form Back wave and returns to start place where rotates transverse vortices. **According Law1** the decelerating transverse vortex generates in transverse direction accelerating longitudinal vortex. This means that the fastest is the central vortex. It is a longitudinal wave and it does not experience and exert friction towards the environment. The light wave is transverse vortex with maximal speed equals to (c) [9,19].

Result: The central accelerating vortices should be reach velocity more than light speed (c).

The lack of resistance is the reason the accelerating longitudinal vortex to reach speed more then light speed (which is only a transverse wave).

Conclusion: The longitudinal accelerating Funnel transforms part of the matter (from periphery to inward) to energy (in center).

These conclusions apply when is transformed one type of movement (transverse) as matter into another type
(longitudinal) as energy. Above conclusions apply and are true only for transformation from transverse to longitudinal movement.

E) Attention for Exception
These above conclusions do not apply to the **transverse motion** of an elementary particle (for example an electron) which consists of transverse vortex .The electron (which consists from transverse vortex) can move with velocity limitted to light speed (c) in a similar medium (which consists also of primary transverse vortices-vacuum) In this case the electron will stick and adhere to itself the primary transverse vortices and increase its mass according to the well known genius formula Einstein's: $E= mc^2$. This formula is thrue only when electron moves transversely as **monolithic body**.

But if the electron is considered as a **composite body** and its perpendicular longitudinal vortex (component) is accelerated, this component makes a **longitudinal motion**. Then the electron will

unraveled and unwind. This is the reason the electron to reduce its volume, its weight, and its mass.

6. Main Conclusion

The Electromagnetic field consists of transverse vortices. They move at a constant speed (maximum to light speed, c) and zero acceleration. The maximum speed is light speed (c) Because they are transversely kind of structure they form pair of orthogonal vortices. They are not packed into the Funnels.

The **Gravitational field** is made up of longitudinal vortices. They move at a variable speed (accelerating or decelerating) and with variable acceleration (positive or negative). That is why they are packaged in Gravitational Funnels (accelerating or decelerating), which generate (absorb or emit) Gravitational waves.

The acceleration carried by the longitudinal vortices (positively or negatively) causes distortion of the surrounding Space in the form of **Accretion disks**.

The negative acceleration of the decelerating Funnel creates **transverse Gravity waves from the inside- out**. In addition, the peripheral vortices of the decelerating Funnel act as a mixer and generate elementary particles (protons) by sucking in and sticking to themselves primary transverse vortices from the environment. In this way, the decelerating Funnel **transforms the energy (velocity) of the central vortices in matter (mass)** of peripheral vortices.

The positive acceleration of the accelerating Funnel creates **transverse Gravitational wave outward-inward**. In addition, the peripheral vortices of the accelerating Funnel act as a sucker for elementary particles (electron) by sucking and annihilate transverse vortices of the electron. In this way, the accelerating Funnel **transforms the matter (mass) of the peripheral vortices into the energy (velocity)** of the central vortices.

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