

Energy Pairs might turn to some sort of Dark Energy

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Abstract

After the presentation of the Special Relativity Theory, Mass was discovered to be a special form of Energy.

Thus, after the presentation of the Special Relativity Theory, the Electric Charge remained the only distinct entity that is not Energy.

In a separate article the claim that electric charges might be considered also as a form of energy was presented and discussed, from various angles.

However, this article focuses on the most potent argument, that the claim that Electric Charge might be a form of Energy, might be a valid claim.

This argument is based on another claim, that if electric charges are a form of energy they must belong to a set of Energy Pairs, and the reason for that is as follows:

Because charge comes in two types, a positive charge and a negative charge, then, the energy embedded in charge must also come in two energy types, which are assigned to one set of Energy Pairs.

Actually, the fact that charge comes in two types might be one of the crucial reasons why it was difficult to recognize charge as another form of energy.

This article analyzes the energy embedded in electric and magnetic fields, and shows that such energies, which rely on the existence of a force field (electric or magnetic) at any point in space in order to exist in this point in space, can annihilate each other, in certain situations, an annihilation that seems to violate the Energy Conservation Principle.

This article describes such a specific physical scenario which actually shows a situation in which during a collision of two electromagnetic traveling waves transmissions that occur in a specific constellation, the two waves, which each contain energy, disappear, which is a clear violation of the Energy Conservation Principle.

Thus, this article assigns the energy embedded in electric fields generated by positive charges, and energy embedded in electric fields generated by negative charges also to one set of energy pairs.

And, this article assigns the energy embedded in magnetic fields generated by moving positive charges, and energy embedded in magnetic fields generated by moving negative charges to another set of energy pairs.

Then, this article uses the Energy Pairs Theory, to explain Energy Conservation issues in electric and magnetic fields, by assuming that energies belonging to energy pairs of equal intensities residing in the same space volume, might annihilate each other, in certain conditions.

Thus, the above mentioned physical scenario actually proves the validity of the Energy Pairs Theory.

This scenario can be converted, at least in principle, to a physical experiment which might provide an additional validity to the Energy Pairs Theory. This article also describes how such an experiment can be arranged.

Then, because energies in electric and magnetic fields are generated initially from electric charges, the Energy Pairs Theory is also used to explain the issue of charge disappearance in electron positron collisions.

This is done, by assuming that, as electric and magnetic energies are shown to annihilate each other and disappear, in certain situations, positive and negative charge might also annihilate each other in certain situations, such as, in electron positron collisions, which strengthen the claim that electric charges are also a form of energy.

Because, if electric charges are claimed to be energies, their embedded energy should be also assigned to a set of Energy Pairs, and since the Energy Pairs Theory was already shown to be a valid theory, and it also explains electric and magnetic energy disappearance in certain conditions, analogous to that, it can explain the charge disappearance in electron positron collisions.

Also, the above mentioned scenario might also show that Energy Pairs might turn into some sort of Dark Energy, which is a mystery that the science of Physics seeks a solution to it.

Also, the mutual annihilation of energies belonging to energy pairs can be viewed not only as mutual annihilation but also as mutual disabling.

This idea equates the complete emptiness with substance, assuming that complete emptiness is a state in which energies of energy pairs **exist** and their mutual disabling is actually seen as complete emptiness.

This idea also can be extended to assume that this state of complete emptiness, which actually contains energy pairs, is the **eternal** state of existence.

And since complete emptiness is a state that **do contain** energies which disable each other, this concept can be further extrapolated to assume that energy pairs can evolve together from this complete emptiness, which discards the need for the concept of creation.

Then, by combining the last two assumptions, the assumption that energies belonging to energy pairs residing in the same space volume might disable each other in certain conditions, and the assumption that energy pairs might evolve together from nothing in certain conditions, the energy pairs can be seen as being able to turn into some sort of the Dark Energy which might be also seen as the complete emptiness.

Because, the assumption that the complete emptiness actually contains energy pairs that disable each other makes it containing energies that are untraceable, as the Dark Energy is.

And, the assumption that energy pairs can emerge together from nothing (or complete emptiness) might explain how this Dark Energy is able to enter into activity, at certain conditions.

Introduction

After the presentation of the Special Relativity Theory, Mass was discovered to be a special form of Energy.

Thus, after the presentation of the Special Relativity Theory, the Electric Charge remained the only distinct entity that is not Energy.

In a separate article, named "Electric Charges as Energy Pairs" that can be found at <http://viXra.org/abs/1909.0098> the assumption that Charge might be also considered as a form of Energy, as Mass turned to be, was presented and discussed from several angles.

However, this article focuses on the most potent argument, that the claim that Electric Charge might be a form of Energy, might be a valid claim.

This argument is based on another claim, that if electric charges are a form of energy they must belong to a set of Energy Pairs, and the reason for that is as follows:

Because charge comes in two types, a positive charge and a negative charge, then, the energy embedded in charge must also come in two energy types, which are assigned to one set of Energy Pairs.

Actually, the fact that charge comes in two types might be one of the crucial reasons why it was difficult to recognize charge as another form of energy.

This article analyzes the energy embedded in electric and magnetic fields, and shows that such energies, which rely on the existence of a force field (electric or magnetic) at any point in space in order to exist in this point in space, can annihilate each other, in certain situations, an annihilation that seems to violate the Energy Conservation Principle.

This article describes such a specific physical scenario which actually shows a situation in which during a collision of two electromagnetic traveling waves transmissions that occur in a specific constellation, the two waves, which each contain energy, disappear, which is a clear violation of the Energy Conservation Principle.

Thus, this article assigns the energy embedded in electric fields generated by positive charges, and energy embedded in electric fields generated by negative charges also to one set of energy pairs.

And, this article assigns the energy embedded in magnetic fields generated by moving positive charges, and energy embedded in magnetic fields generated by moving negative charges to another set of energy pairs.

Then, this article uses the Energy Pairs Theory, to explain Energy Conservation issues in electric and magnetic fields, by assuming that energies belonging to energy pairs of equal intensities residing in the same space volume, might annihilate each other, in certain conditions.

Thus, the above mentioned physical scenario actually proves the validity of the Energy Pairs Theory.

This scenario can be converted, at least in principle, to a physical experiment which might provide an additional validity to the Energy Pairs Theory. This article also describes how such an experiment can be arranged.

Then, because energies in electric and magnetic fields are generated initially from electric charges, the Energy Pairs Theory is also used to explain the issue of charge disappearance in electron positron collisions.

This is done, by assuming that, as electric and magnetic energies are shown to annihilate each other and disappear, at certain situations, positive and negative charge might also annihilate each other in certain situations, such as, in electron positron collisions, which strengthen the claim that electric charges are also a form of energy.

Because, if electric charges are claimed to be energies, their embedded energy should be also assigned to a set of Energy Pairs, and since the Energy Pairs Theory was already shown to be a valid theory, and it also explains electric and magnetic energy disappearance in certain conditions, analogous to that, it can explain the charge disappearance in electron positron collisions.

Also, the above mentioned scenario might also show that Energy Pairs might turn into some sort of Dark Energy, which is a mystery that the science of Physics seeks a solution to it.

Also, the mutual annihilation of energies belonging to energy pairs can be viewed not only as mutual annihilation but also as mutual disabling.

This idea equates the complete emptiness with substance, assuming that complete emptiness is a state in which energies of energy pairs **exist** and their mutual disabling is actually seen as complete emptiness.

This idea also can be extended to assume that this state of complete emptiness, which actually contains energy pairs, is the **eternal** state of existence.

And since complete emptiness is a state that **do contain** energies which disable each other, this concept can be further extrapolated to assume that energy pairs can evolve together from this complete emptiness, which discards the need for the concept of creation.

Then, by combining the last two assumptions, the assumption that energies belonging to energy pairs residing in the same space volume might disable each other in certain conditions, and the assumption that energy pairs might evolve together from nothing in certain conditions, the energy pairs can be seen as being able to turn into some sort of the Dark Energy which might be also seen as the complete emptiness.

Because, the assumption that the complete emptiness actually contains energy pairs that disable each other makes it containing energies that are untraceable, as the Dark Energy is.

And, the assumption that energy pairs can emerge together from nothing (or complete emptiness) might explain how this Dark Energy is able to enter into activity, at certain conditions.

This also agrees with Quantum Mechanics physics prediction that there is no such thing as complete emptiness (or absolute nothing), and it always contains random quantum fluctuations in which negative energy annihilates same amounts of positive energy.

Proof of the Energy Pairs Theory

As already mentioned in the previous paragraph, This article analyzes the energy embedded in electric and magnetic fields, and shows that such energies, which rely on the existence of a force field (electric or magnetic) at any point in space in order to exist in this point in space, can annihilate each other, in certain situations, an annihilation that seems to violate the Energy Conservation Principle.

A perceptible or concrete example that Energy Pairs might be a valid concept can be seen through the following example:

An electromagnetic traveling wave transmission is a combination of synchronized oscillating electric and magnetic fields, perpendicular to each other, traveling at the speed of light and having energy proportional to its electric and magnetic fields intensities.

Since electric and magnetic fields are vectors that might annihilate each other if they coexist together in the same space volume and have equal intensities and opposite polarity, then, scenarios of two such electromagnetic traveling wave transmissions that collide such that their electric and magnetic fields annihilate each other continuously after the collision moment, can be devised.

An example of such a scenario is shown schematically in Fig 1, and is described as follows:

Imagine a very very very focused electromagnetic traveling wave transmission which travels in a straight line in a specific direction. On the same straight line, in exactly the same direction, another very very very electromagnetic traveling wave transmission starts.

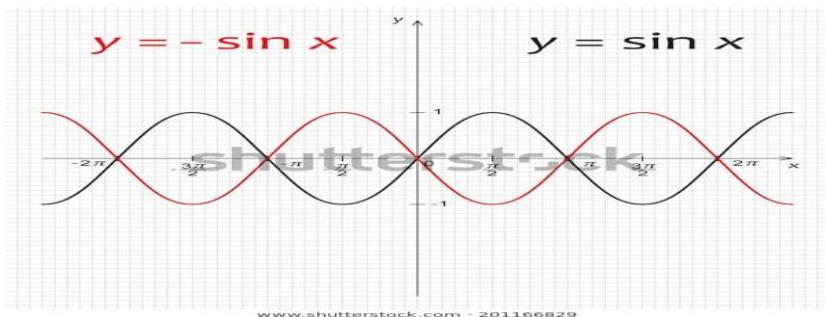
Both electromagnetic traveling wave transmissions have exactly the same intensities in their electric fields, and exactly the same intensities in their magnetic fields, and both electromagnetic traveling wave transmissions are oscillating at exactly the same frequency, and, of course, both travel at exactly the same speed, the speed of light, on the above mentioned straight line, in the same direction.

Also, the second electromagnetic traveling wave transmission starts at the beginning of its oscillating cycle, meaning that, at this moment, its electric and magnetic fields have zero intensities. And, at this starting moment, and at exactly the point in the traveling line where the second transmission started, also the first electromagnetic traveling wave transmission arrives at its electric and magnetic fields to zero intensity points.

And from this moment on, the cycles of oscillation of both electromagnetic traveling wave transmissions are such that the polarity of their electric fields are opposite to one another, and the same applies to the polarity of their magnetic fields.

Fig. 1 below shows the oscillating electric field of the first wave (for example the red wave) relative to the oscillating electric field of the second wave (the blue wave) at any point on the traveling line, after the point where the second wave started. And, the same applies to the oscillating magnetic fields of these waves, after the point where the second wave started.

Fig. 1



These transmissions will annihilate each other electric and magnetic fields, following the starting moment of the second electromagnetic traveling wave transmission.

However, the first electromagnetic transmission contained energy proportional to its electric and magnetic fields intensities prior to the starting moment of the second electromagnetic traveling wave transmission.

Thus, following the starting moment of the second electromagnetic traveling wave transmission the energy of the first wave disappear and the energy that was going to be embedded in the second electromagnetic traveling wave transmission also, does not exist anymore.

The outcome of this scenario is, by no means, surprising and even troubling.

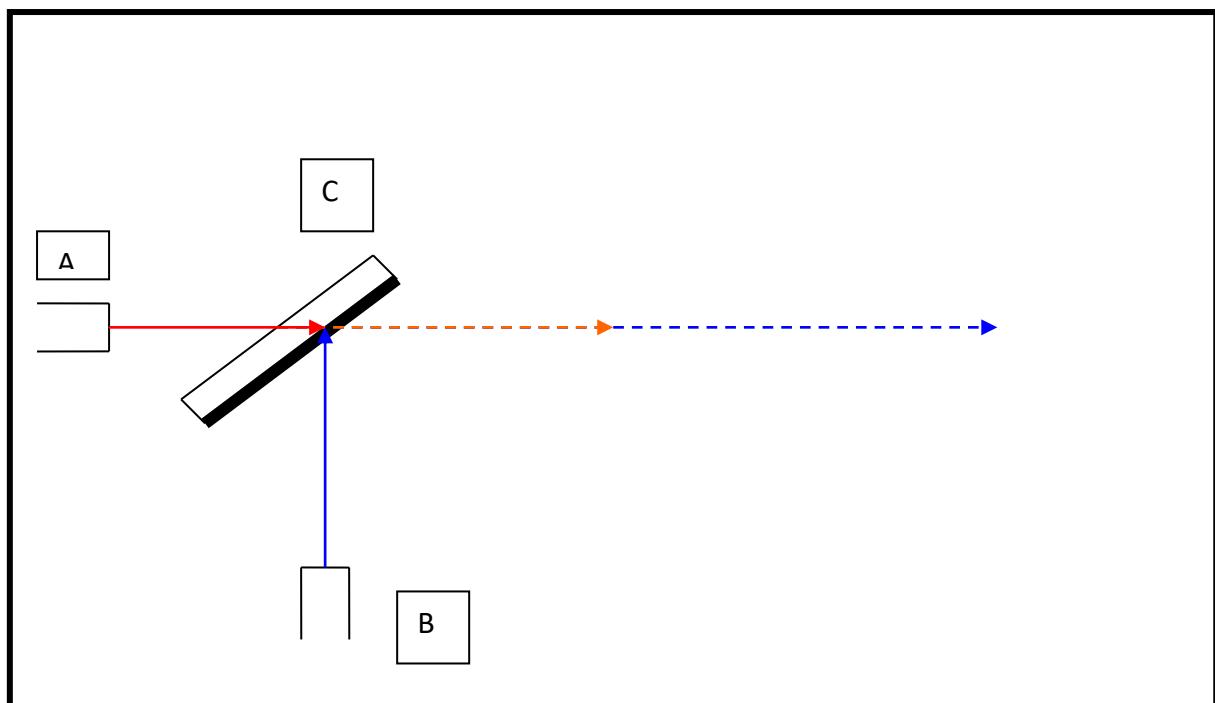
If the energies of both transmissions disappear following the starting moment of the second electromagnetic traveling wave transmission , this violates the Energy Conservation Principle.

On the other hand, this might be a proof that the Energy Pairs Theory presented in the previous section above, which claims that energies belonging to Energy Pairs might annihilate, or disable, each other, in certain conditions, is a viable concept.

This is, actually, what happens, for example, with electric and magnetic fields of opposite signs, that exist in the same space volume, which cause mutual canceling also of the energies associated with these fields, as described before.

This scenario can be converted, at least in principle, to an experiment, as described in Fig 2. It might be difficult to devise an experiment that fulfill all the requirements described above, but this is a technological issue.

Fig 2



The following describes the experiment shown schematically in Fig 2:

A laser beam gun A generates the very very very focused first (red) electromagnetic traveling wave transmission, which passes through the half transparent mirror C, and is supposed to continue, after it passes the half transparent mirror C (as the dotted red line indicates).

A second laser beam gun B generates the very very very focused second (blue) electromagnetic traveling wave transmission, that is deflected by the mirror C, such that it is supposed to continue on exactly the same line as the first wave (as the dotted blue line indicates).

However, the experiment is designed such that the blue wave is deflected exactly when its electric and magnetic fields are at the beginning of their oscillating cycle, meaning that, at this moment, its electric and magnetic fields have zero intensities.

And, the red wave passes through the half transparent mirror at exactly the moment when the blue wave is deflected by that mirror, and, its electric and magnetic fields are also at the zero intensity points, at this moment.

And from this moment on, the cycles of oscillation of both waves are such that the polarity of their electric fields are opposite to one another, and the same applies to the polarity of their magnetic fields (as shown in Fig 1). And, since the experiment is designed such that the deflected blue wave and the red wave that passes the mirror have exactly the same intensities in their electric and magnetic fields, and oscillate at exactly the same frequency, their electric and magnetic fields annihilate each other, from this moment on, continuously, as the dotted lines indicate.

Another issue might be the question of what happens with the photons, which are the particle manifestation of these electromagnetic travelling wave transmissions. Do they also disappear when the electric and magnetic fields annihilate each other continuously? If an experiment will be conducted, this might answer this issue.

However, only from the description of the described scenario, one might conclude that the above described scenario is a concrete physical manifestation how electric and magnetic fields belong to Energy Pairs, as described in the previous paragraph of this article.

And, thus, can be seen as a proof of this Energy Pairs theory which claims that energies belonging to Energy Pairs might annihilate each other in certain conditions.

Then, by assuming that, as electric and magnetic energies are shown to annihilate each other and disappear, in certain situations, positive and negative charge might also annihilate each other in certain situations, such as, in electron positron collisions, which strengthen the claim that electric charges are also a form of energy.

Because, if electric charges are claimed to be energies, their embedded energy should be also assigned to a set of Energy Pairs, and since the Energy Pairs Theory was already shown to be a valid theory, and it also explains electric and magnetic energy disappearance in certain conditions, analogous to that, it can explain the charge disappearance in electron positron collisions.

Energy Pairs might resolve Energy Conservation Issues

The Energy Pairs Theory can be used to provide an explanation to a magnetic field potential energy conservation paradox.

This magnetic field potential energy conservation paradox is described as follows:

When a body is charged with electric charges of a certain polarity (such as positive electric charges) and a certain amount of charge, and the body is moved at a specific constant speed in a certain direction, it creates a magnetic field $B^->$ around it whose embedded energy per unit volume u is provided by the following formula:

$$u = |B^->|^2 / (2 \mu_0) \quad (\text{Ref. 2})$$

Where μ_0 is the vacuum magnetic permeability and is equal to:

$4\pi 10^{-7}$ H/m (Henry per meter).

While the magnetic field $B^->$ is described by:

$$B^-> = (\mu_0 / (4\pi)) (q (v^-> \times r^->) / r^2) \quad (\text{Ref. 1})$$

When a second body is charged with electric charges of the opposite polarity (negative electric charges) but with the same amount of charge, and that body is also moved at the same constant speed in the same direction, it creates a magnetic field in the same space volume, whose magnitude is still expressed by the same formula that

describes the magnetic field $B^->$ created by the first body when it was moved, but its direction (or polarity) is inverse to the polarity of the magnetic field $B^->$ that the first body created when it was moved. But, the embedded energy per unit volume of the magnetic field created by that second body is still expressed by the formula presented before for energy per unit volume in a magnetic field. (Ref. 2).

When both bodies are tied to an apparatus that keeps them very close to each other, (but inhibits them from being attracted completely to each other), and both bodies are moved together, at the same speed, in the same direction, no magnetic field is created around them (or a negligible magnetic field, because the bodies are not exactly at the same point in space).

The reason why in that third case scenario basically no magnetic field was created is well understood.

Magnetic fields obey the superposition rule. Since the first body creates a magnetic field which has the same intensity, but inverse polarity compared to the magnetic field the second body creates, and both magnetic fields occupy the same volume in space, they cancel each other, and basically no magnetic field is created in that volume in space. However, there is still a paradox, concerning the conservation of the energy embedded in these two magnetic fields.

The first body does not "know" that a second, inverse magnetic field is created, and it still creates its own magnetic field. This magnetic field embeds an energy per unit volume described by the formula above (Ref. 2). The same is true for the second body. So, the fact that each field cancels the other, contradicts the energy conservation principle, since the energies of both fields also disappear.

A logical explanation to that paradox might be the assumption, that certain energies, such as magnetic fields embedded energies, come in an Energy Pairs form.

And, energies belonging to energy pairs might annihilate each other in certain conditions.

Actually, since the energy density in a magnetic field depends on the magnitude of the magnetic field $B^{->}$ in space at each point, and $B^{->}$ is a vector which can be cancelled by another vector of similar size but opposite direction, it is obvious that the energy density of a magnetic field is not a complete scalar.

Thus, in case of magnetic fields energy, the condition of annihilation is clear, and it happens when another magnetic field exists at the same space volume, with equal magnitude and opposite direction.

From the above, it is obvious that the Energy Pair for magnetic fields contains the following two energy types: one type is the energy embedded in magnetic fields created by positive charges, the other type is the energy embedded in magnetic fields created by negative charges.

The Energy Pairs assumption is actually derived from the assumption that charge is another form of energy, because such energy must have two values, one for the energy attributed to positive charges, and one for the energy attributed to negative charges.

This naturally results in the energy attribution (or type) assigned to the energy embedded in a magnetic field created by a positive charge, being different from the energy attribution (or type) assigned to the energy embedded in a magnetic field created by a negative charge. And, thus, these two types of magnetic energies belong to one set of Energy Pairs.

Thus, the assumption that charge is another form of energy, also provide the support for assuming that certain energies exist as Energy Pairs.

This brings about another conclusion which implies that energy conservation exists only when the total amount of energy in a specific volume in space contains only one member of energies which belong to this Energy Pairs.

Similarly, to the explanation of the magnetic field energy conservation paradox, the Energy Pairs Theory provides a similar explanation to a similar electric field energy conservation paradox.

This electric field energy conservation paradox is very similar to the magnetic field energy conservation paradox. Thus, it will be described here more briefly, since its description is very similar to the description of the magnetic field energy conservation paradox.

When a body is charged with electric positive charges it creates an electric field around it whose embedded energy per unit volume u is provided by the following formula: (Ref. 3).

$u_e = \epsilon_0 |E^{->}|^2 / 2$. Where $E^{->}$ is the electric field magnitude in the unit volume, and ϵ_0 is the vacuum permittivity and is equal to: $8.854187817\dots \times 10^{-12} \text{ F/m}$ (Farad per meter)

When a second body is charged with same amount of negative charges, it creates an electric field whose polarity is inverse to the polarity of the electric field that the first body created.

But, the embedded energy per unit volume of the electric field created by that second body is still expressed by the formula presented before for energy per unit volume in an electric field. (Ref. 3)

When both bodies are tied to an apparatus that keeps them very close to each other, (but inhibits them from being attracted completely to each other), no electric field is created around them (or a negligible electric field, because the bodies are not exactly at the same point in space).

As before, the paradox is, again, the fact that the energies also disappear, although, each charge is not "aware" of the other charge, and, thus, is supposed to create still its own electric field with its own embedded energy.

Equating Emptiness to Substance

Since Energy Pairs of equal intensities residing in the same space volume annihilates to nothing, then, the Energy Pairs concept can be extrapolated to predict that Energy Pairs can be also generated out of nothing.

Actually, the extrapolation just mentioned can be extended as follows:

It can be assumed, that the fact that energy pairs of equal intensities residing in the same space volume annihilate each other, can be viewed not as mutual annihilation, but as mutual disabling.

In other words, these energy pairs can be assumed to continue to exist, but their mutual existence in the same space volume causes each of them to disable the other, such that the net result is only seen as annihilation.

This is, actually, what happens, for example, with electric and magnetic fields of opposite signs, that exist in the same space volume, which cause mutual canceling also of the energies associated with these fields.

This view attributes to the nothing (or complete emptiness) concept the same validity as the validity attributed to the existence (or substance) concept, assuming that the complete emptiness might be a combination of energy pairs that disable each other, and might be related to the Dark Energy mystery, since it does contain energies that cannot be traced.

and since this concept also assumes that something can evolve from nothing, it discards the need for the concept of creation.

Actually, this concept might view the state of complete emptiness (or combinations of energy pairs that disable each other) as the steady state of the existence that was, is and will be eternal, and, might transform into a different state of existence, in which energy pairs, (for example, negative and positive charges) are created out of nothing, or converted to nothing (for example, in electron positron collisions).

Energy Pairs might be some sort of Dark Energy

By combining the two assumptions presented in the previous paragraphs, the assumption that energies belonging to energy pairs residing in the same space volume might disable each other in certain conditions, and the assumption that energy pairs might evolve together from nothing in certain conditions, the complete emptiness and the energy pairs can be actually seen as some sort of the Dark Energy, that the science of physics seeks.

Because, the assumption that the complete emptiness actually contains energy pairs that disable each other makes it containing energies that are untraceable, as the Dark Energy is.

And, the assumption that energy pairs can emerge together from nothing (or complete emptiness) might explain how this Dark Energy is able to enter into activity, at certain conditions.

The two transmissions scenario described before can be also seen as a manifestation that Energy Pairs might turn to a sort of Dark Energy, since the state of the energies embedded in the two colliding electromagnetic transmissions, after this collision, can be seen as the energies being still existing but disabling each other, such that they might belong to some sort of existing Dark Energy, that can't be traced.

And, the assumption that energy pairs can emerge together from nothing (or complete emptiness) might explain how this Dark Energy is able to enter into activity, at certain conditions.

Actually, the above described scenario can be also seen as equating the Complete Emptiness with this Dark Energy state.

The prediction that Energy Pairs can be generated out of nothing provides also a connection between the Quantum Mechanics physics and rest of physics, because also Quantum Mechanics physics predicts that there is no such thing as complete emptiness (or absolute nothing), and it always contains random quantum fluctuations in which negative energy annihilates same amounts of positive energy.

Summary, Results and Conclusions

If the assumption of charge being a form of energy, as presented in additional articles, is found viable, then, the Energy Pairs Theory can provide explanations to energy conservation issues in electric and magnetic fields, in addition to supplying explanation to the issue of charge disappearance in electron positron collisions.

Also, from the assumption that the complete emptiness actually contains energy pairs that disable each other, another assumption is presented, that Energy Pairs might also emerge from this complete emptiness.

By combining the last two assumptions, the assumption that energies belonging to energy pairs residing in the same space volume might disable each other in certain conditions, and the assumption that energy pairs might evolve together from nothing in certain conditions, the complete emptiness and the energy pairs can be actually seen as some sort of the Dark Energy, that the science of physics seeks.

Because, the assumption that the complete emptiness actually contains energy pairs that disable each other makes it containing energies that are untraceable, as the Dark Energy is.

And, the assumption that energy pairs can emerge together from nothing (or complete emptiness) might explain how this Dark Energy is able to enter into activity, at certain conditions.

This agrees with Quantum Mechanics physics prediction that there is no such thing as complete emptiness (or absolute nothing), and it always contains random quantum fluctuations in which negative energy annihilates same amounts of positive energy.

This article also presents a specific scenario, of a specific collision between two electromagnetic transmissions, that can be conducted as an experiment. This experiment, if succeeded, can be seen as a demonstrated proof of the Energy Pairs theory, which might also strengthen the validity of the claim that charge itself is some sort of energy. Also, this experiment, if succeeded can show that energies belonging to Energy Pairs might turn into some sort of Dark Energy.

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