Energy Pairs resolve energy conservation issues

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Abstract

In separate articles such as: "Energy Pairs Theory" that can be found at http://viXra.org/abs/1910.0523 the Energy Pairs Theory was presented.

This theory explained energy loss in a scenario described in several separate articles such as: "Consolidated Waves might create Dark Energy" that can be found at http://viXra.org/abs/1909.0496 which described two one dimensional electromagnetic traveling waves, which collide and then continue to travel in the same direction, which manifested loss of the energy that these waves carried before that consolidation, and even full disappearace of these waves, which seemed to be a clear violation of the Energy Conservation Principle.

In this article other energy conservation issues related to electric and magnetic fields are presented, and explained via this Energy Pairs Theory.

Introduction

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Energy Pairs might resolve Energy Conservation Issues

The Energy Pairs Theory can be also 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 spcific 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:

$u = |B^{->}|^2/(2\,\mu_0)$ (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:

$B^{->} = (\mu_0/(4\pi))(q(\,v^{->}\ X\ r^{->}\,)/r^2)$ (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 is 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 mutual annihilation of energies belonging to Energy Pairs can be also viewed not as mutual annihilation but as mutual disabling, assuming that the energies **exist** as Energy Pairs and their mutual disabling is only seen as annihilation.

An analogy to the above might be the discription of what happens to the energy in a rope in a rope pulling game. When two people pull a rope, each in a direction opposite to the other, if their pulling force is exactly equal, the rope does not move. However, this does not mean that the pulling energies that are exerted on the rope really annihilate each other or disappear. These energies are accumulated or amassed in the rope.

The same should occur when two electric fields forces (or magnetic fields forces) of exactly the same intensity and opposite polarity annihilate each other. The energies of these electric (or magnetic) fields are not annihilated or disappear, they are accumulated or ammased in the location in space where they reside, but they cannot express themselves. They only disable each other.

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).

$u_e = \varepsilon_0 |E^{->}|^2/(2)$. Where $E^{->}$ is the electric field magnitude in the unit volume, and ε_0 is the vacuum permittivity and is equal to: $8.854187817\ldots x\ 10^{-12}$ 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.

Summary, Results and Conclusions

In separate articles such as: "Energy Pairs Theory" that can be found at http://viXra.org/abs/1910.0523 the Energy Pairs Theory was presented.

This theory explained energy loss in a scenario described in several separate articles such as: "Consolidated Waves might create Dark Energy" that can be found at http://viXra.org/abs/1909.0496 which described two one dimensional electromagnetic traveling waves, which collide and then continue to travel in the same direction, which manifested loss of the energy that these waves carried before that consolidation, and even full disappearace of these waves, which seemed to be a clear violation of the Energy Conservation Principle.

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In several separate articles, such as: "Electric Charges as Energy Pairs" that can be found at http://viXra.org/abs/1909.0098 and "Energy Pairs might turn to Dark Energy" that can be found at http://viXra.org/abs/1909.0149 some of the issues presented in this article such as the Energy Pairs Theory is also presented, with more details.

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