

A Modification of the Electron Positron-Photon Idea Might Provide a Resolution to the Wave-particle Problem of Electromagnetic Waves

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Abstract

The Electron Positron-Photon idea, which is due originally to (the late) Prof. J. P. Wesley, in his article titled: "Light, a Flux of Electric Dipole Photons" [4], proposed a model of the Photon as an Electric Dipole Photon which might be an Electron-Positron pair separated by a distance L . However, since Photons propagate at the speed of light, and Electrons and Positrons have rest Mass values which are not zero, then, if Einstein's Special Relativity Theory conclusion, relating to Mass gain with velocity, is accepted as valid, then, if Photons are Electron-Positron pairs, their Mass must increase to be virtually an infinite value. Thus, if Einstein's Special Relativity Theory is accepted as a valid theory, Photons cannot be pairs of Electrons and Positrons. J.P. Wesley did not accept the relativistic Mass gain with velocity as concluded from Einstein's Special Relativity Theory, and as such, proposed this Photon model, which provides a possible resolution to the Wave-Particle problem of Electromagnetic waves, exhibiting two separate facets simultaneously, the Wave facet and the Particle facet, (or the Photon's facet). However, the new Energy Pairs Theory might provide a modification to the J.P. Wesley's Electron Positron Photon idea, by presenting the argument, that Photons embed also Untraceable Energy, in addition to Traceable Energy, and this Untraceable Energy, might still exhibit the behavior of an Electric Dipole, even though, these Untraceable (or Dark) Energy are pure Energy, with no Mass associated to them.

The new Energy Pairs Theory argues that such Untraceable Energy embedded in a Photon might be also the result of a Mutual Annihilation between an Electron and a Positron. In this Mutual Annihilation scenario, the new Energy Pairs Theory argues, that the Masses of the annihilating Electron and Positron are embedded in the Traceable Energy embedded in the created Photons and the Electric Charges of the annihilating Electron and Positron are converted to the Untraceable Energy embedded in the created Photons.

Also, the new Energy Pairs Theory argues that in the inverse Pair Production scenario, in which a Photon, in certain conditions, converts back to an Electron and a Positron, the Traceable Energy embedded in the Photon is converted into the Masses of the created Electron and Positron, and the Untraceable Energy embedded in the Photon, is converted into the Electric Charges of the created Electron and Positron.

So, according to the new Energy Pairs Theory, because Photons can embed both, Traceable Energy and Untraceable Energy, and because this Untraceable Energy originate from physical Electric Charges and converts back to physical Electric Charges, and also because this Untraceable Energy is Untraceable because it is accumulated in Pairs which Disable each other from being Detected, it might be argued, that this Untraceable Energy might also retain their ability to function as an Electric Dipole, as the original physical Electric Charges could act as Electric Dipoles before being converted into Untraceable Energy.

Thus, the new Energy Pairs Theory argues that the Untraceable Energy embedded in Photons can behave as Electric Dipoles even though they are embedded in the Photon as pure Untraceable Energy, without any Mass associated to them, and not as physical Electric Charges.

This might resolve the issue mentioned above, relating to the Electron Positron-Photon idea, as presented in J. P. Wesley's paper, because if such Electric Dipoles embedded in the Photons, are just pure Energy (although Untraceable Energy) without any Mass associated to them, they can travel at the speed of light, and still retain the possibility to explain the Wave-Particle problem of Electromagnetic waves as brought about by J.P. Wesley's paper.

1. Introduction

The Wave-Particle problem of Light, as presented in J.P. Wesley's paper, "dates back to Newton's days". The question of Light being "a flux of particles", or a "propagated perturbation in a medium or luminiferous ether" resulted in the Science of Physics accepting the conclusion that light manifests two facet simultaneously, a Wave facet and a Particle facet.

The Wave facet or "the periodic nature of light, was first recognized by Newton, who measured the wavelength of light with his Newton's rings interference observations."

Then, the conclusion derived from Maxwell's equations, that accelerating Electric Charges emit radiation in the form of Electromagnetic Waves brought about the understanding that Light is just a subset group of frequencies of the broader phenomena of Electromagnetic Waves.

Then, after the Photoelectric Effect was explained by Einstein the science of Physics concluded that Electromagnetic Waves (including Light), are also streams of Particles, namely the Photons, which established the recognition, that Light, and any other Electromagnetic Wave, have also a Particle facet.

However, although the science of Physics accepts these two simultaneous facets of Light, and any other Electromagnetic Waves, this situation, in which Light, and any other Electromagnetic Waves, embeds such separate facets simultaneously, seems to be an unnatural situation, which seems like an open problem, that should be resolved.

The Electron Positron-Photon idea, which is due originally to (the late) Prof. J. P. Wesley, in his article titled: "Light, a Flux of Electric Dipole Photons" [4], tried to resolve this problem.

It proposes a model of the Photon as an Electric Dipole Photon which might be an Electron-Positron pair separated by a distance L . This model might explain why a flux of such Electric Dipoles might also exhibit the Wave facet of travelling Electromagnetic Waves which contain synchronized, oscillating Electric and Magnetic fields, which are perpendicular to each other and travel both at the speed of light, and this Wave facet is simultaneously also a stream of particles, namely the Photons, which are composed of the Electron Positron pair mentioned above.

However, because Electromagnetic Waves travel at the speed of Light, this model is inconsistent with Einstein's Special Relativity Theory which concludes a Mass increase with velocity. Since such Electric Dipoles, as proposed by J.P. Wesley's paper, are composed of Electron-Positron pairs, and Electrons and Positrons embed rest Mass, which is not zero, their Mass should increase virtually to infinity. J.P. Wesley proposed this model because he did not accept the relativistic Mass gain with velocity, concluded from Einstein's Special Relativity Theory.

Thus, since Einstein's Special Relativity Theory is the acceptable theory by the nowadays science of Physics, and its conclusions, including the conclusion regarding Mass increase with velocity is accepted, and its validity was also manifested via observations, then, the proposed model of Photons, brought about by J. P. Wesley's paper, as Electron-Positron pairs, seems to be a non-viable model.

However, as will be elaborated, in the following sections of this paper, the new Energy Pairs Theory, might modify J.P. Wesley's paper, to resolve this issue, and thus, bring about a possible viable explanation to the old Wave-Particle problem of Electromagnetic Waves.

2. The new Energy Pairs Theory resolves Paradoxes embedded in Scenarios of Consolidating Electromagnetic Waves from Separate Sources

The new Energy Pairs Theory was initially introduced to resolve Paradoxes embedded in Consolidating Electromagnetic Waves from Separate Sources.

An article titled: “Consolidating Electromagnetic Waves from Separate Sources” [6], by the author of this article, provides very sound argumentations, that Electromagnetic Magnetic Waves from separate sources can and do consolidate, even though the acceptable notion today, by the science of Physics, is, that this cannot occur.

An example of the acceptable notion today that this cannot occur is presented in an article by Kirk T. McDonald from Princeton University whose title is: “Does Destructive Interference Destroy Energy?” [5] which states: “A one-dimensional wave moving in one direction can have only one source, and there can be only one such wave at a given point”, which implies that Electromagnetic Waves from separate sources cannot consolidate.

However, as stated above, the article already mentioned above [6], by the author of this article, provides sound argumentations that Electromagnetic Waves from separate sources can and do consolidate, even though, such consolidations embed Paradoxes, because such consolidations seem to violate the Energy Conservation Principle.

One such paradox is the creation of a Null Electromagnetic wave, which contains no Electric and Magnetic fields at all, and thus, seem to embed no Energy at all, from two Electromagnetic Waves which embed Energy, and, in certain conditions, as described in the articles, consolidate to create this Null Electromagnetic Wave. Thus, in such a scenario, Energy seems to disappear, which is a clear violation of the Energy Conservation Principle. That scenario is described in the following articles published by the author of this article: “Energy Analysis of a Null Electromagnetic Wave” [1], and “A Discussion relating to the feasibility of a Null Electromagnetic Wave” [2].

However, the creation of the Null Electromagnetic wave is not the only surprising and astonishing scenario of consolidations of Electromagnetic Waves from separate sources, which seem to violate the Energy Conservation Principle.

The following article, published by the author of this article, “Consolidating Electromagnetic waves might embed more traceable Energy than the sum of the traceable Energies embedded in the waves before consolidation” [3], presents a scenario in which two Electromagnetic Waves, from separate sources, consolidate to create a consolidated Electromagnetic Wave that embeds more Energy as compared to the combined Energies embedded in the two Electromagnetic Waves that created it. In this scenario Energy seems to be created out of nothing, which is also a clear violation of the Energy Conservation Principle.

As stated above, The Energy Pairs Theory, described briefly in the following section of this article, was developed to resolve the Paradoxes embedded in Electromagnetic waves consolidations from separate sources, which seem to violate the Energy Conservation Principle.

3. The new Energy Pairs Theory

The main premise of the new Energy Pairs Theory is as follows:

Energies embedded in Electromagnetic Waves (or related directly or indirectly to an Electric Charge) can accumulate and be stored together in pairs, while disabling each other from being detected, such that the Energies Exist but are Untraceable (or Latent Energy) or Exist as Untraceable or Dark Energy.

Thus, the new Energy Pairs Theory brings about a new Facet of Energy which is Untraceable Energy that is also stored as Energy Pairs.

So, the new Energy Pairs Theory Elements are:

- It Expands the Energy notion to contain two Facets of Energies:
- A Detectable or Traceable Energy
- An Untraceable or Dark Energy
- The Untraceable Energy is Untraceable because it is accumulated in Pairs which Disable each other from being Detected
- The new Energy Pairs Theory also predicts that Photons can carry both, Traceable and Untraceable Energies

4. The new Energy Pairs Theory resolves Paradoxes embedded in Scenarios of Consolidations of Electromagnetic Waves from Separate Sources

The new Energy Pairs Theory resolves the Paradoxes embedded in the scenarios of Consolidations of Electromagnetic Waves from separate sources as follows:

The new Energy Pairs Theory predicts that in the scenario of the creation of the Null Electromagnetic Wave the Energy did not Disappear. It was Converted into Untraceable, or Dark Energy, embedded into the Photons of the created Null Electromagnetic Wave.

The new Energy Pairs Theory also predicts, that in scenarios of consolidations of Electromagnetic Waves that seem to create Energy out of nothing, that created Energy is Untraceable, or Dark Energy, embedded in the created consolidated Electromagnetic Wave, which Converted back, into Traceable Energy.

However, the Paradoxes in scenarios of consolidations of Electromagnetic Waves from separate sources which seem to violate the Energy Conservation Principle, are not the only Paradoxes that get resolved or explained by the new Energy Pairs Theory.

Two additional puzzling questions are also resolved by the new Energy Pairs Theory.

These two additional puzzling questions are:

- Why in the famous Mutual Annihilation scenario, Electric Charges Disappear?
- How come that Electric Charges are created from nothing in the famous inverse Pair Production scenario?

In in Mutual Annihilation scenario an Electron and a Positron annihilate each other to create Photons. But because Electric Charges are not recognized (yet) as a form of Energy, then, according to the Energy Conservation Principle, the Energies embedded in the Masses of the annihilating Electron and Positron is Fully embedded in the Energy embedded in the created Photons, and the Electric Charges of the annihilating Electron and Positron, just Disappear.

Where these Electric Charges went?

How can Basic Elements such as Electric Charges Disappear, without leaving any trace of their prior existence?

And, in the inverse Pair Production scenario, a Photon, in certain conditions, converts back into an Electron and a Positron. But because Electric Charges are not recognized (yet) as a form of Energy, then, according to the Energy Conservation Principle, the Energy embedded in the Photon is Fully embedded in the Masses of the created Electron and Positron, and the Electric Charges of the created Electron and Positron are created from nothing.

How can this happen?

The new Energy Pairs Theory resolves also these two new puzzles:

It predicts that in the Mutual Annihilation scenario the Electric Charges did not Disappear. They were Converted into Untraceable (or Dark) Energies embedded in the created Photons. Similarly, to how the new Energy Pairs Theory

predicts that the Null Electromagnetic Wave embeds the Energy that seemed to Disappear as Untraceable Energy in its Photons.

And in the inverse Pair Production Scenario, the new Energy Pairs Theory predicts, that the Electric Charges which seem to be created from nothing, were Untraceable (or Dark) Energy, embedded in the Photon, which Converts to Traceable Energy embedded in the Electric Charges of the created Electron and Positron.

Thus, another significant conclusion, or prediction, of the new Energy Pairs Theory is:

Electric Charges are just forms of Energy.

However, Mass was already recognized as a form of Energy by Einstein's Special Relativity Theory, and now, the new Energy Pairs Theory adds to this the conclusion that Mass, Electric Charges and Energy, might be the exact same Entity.

This also can be concluded from the following:

Since in the Mutual Annihilation scenario, Electric Charges in the Electron and the Positron converts to Photons, which are pure Energy, without any Mass or Electric Charge, and since, in the inverse, Pair Production scenario, a Photon, which is just pure Energy without any Mass or Electric Charge, converts into Mass and Electric Charges embedded in the created Electron and Positron, this might also imply, that Electric Charges are also just forms of Energy, as Mass is a form of Energy.

And, another important conclusion, or prediction, of the new Energy Pairs Theory might be:

Most of the Dark Energy, whose origin is still a mystery, might originate from Electromagnetism!

5. Modifying J.P. Wesley's paper to comply with Einstein's Special Relativity Theory and still provide its explanation to the Wave-Particle problem of Electromagnetic Waves

Thus, as already stated in a previous section of this article, the new Energy Pairs Theory might be used to modify J.P. Wesley's paper, to comply, on one hand, with Einstein's Special Relativity Theory, and provide, on the other hand, an explanation to the Wave-Particle problem of Electromagnetic Waves, like how J. P. Wesley's paper explains this problem.

As described above, according to the new Energy Pairs Theory, because Photons can embed both, Traceable Energy and Untraceable Energy, and because this Untraceable Energy originate from physical Electric Charges and converts back to physical Electric Charges, and also because this Untraceable Energy is Untraceable because it is accumulated in Pairs which Disable each other from being Detected, it might be argued, that this Untraceable Energy might also retain their ability to function as an Electric Dipole, as the original physical Electric Charges could act as Electric Dipoles before being converted into Untraceable Energy.

Thus, the new Energy Pairs Theory argues that the Untraceable Energy embedded in Photons can behave as Electric Dipoles even though they are embedded in the Photon as pure Untraceable Energy, without any Mass associated to them, and not as physical Electric Charges.

This might resolve the issue mentioned above, relating to the Electron Positron-Photon idea, as presented in J. P. Wesley's paper, because now, it can still be assumed that Photons are pairs of Electron and Positron, but pairs which already annihilated each other and converted to both, Traceable and Untraceable Energies, as the new Energy Pairs Theory predicts.

And if such that Untraceable Energy in the Photon, can retain its ability to act as Electric Dipoles this might explain the Wave-Particle problem of Electromagnetic Waves, as J.P. Wesley's paper explains this problem, on one hand.

And, on the other hand, if that Untraceable Energy Pair embedded in the Photon is just pure Energy (although Untraceable Energy) without any Mass associated to it, Photons can still travel at the speed of light, without violating Einstein's Special Relativity Theory.

6. Summary and Conclusions

Prof. J. P. Wesley, in his article titled: "Light, a Flux of Electric Dipole Photons" [4], tries to explain the Wave-Particle problem of Electromagnetic Waves by proposing a model of the Photon as an Electric Dipole Photon which might be an Electron-Positron pair separated by a distance L .

However, because Electrons and Positrons have rest Mass, which is not zero, this violates Einstein's Special Relativity Theory conclusion of Mass increase with velocity, because if Photons are Electron Positron pairs, and because Photons travel at the speed of light, the Masses of these Electron Positron pairs must increase to be virtually of infinite magnitude.

The new Energy Pairs Theory, provided by the author of this article, might be used to modify J. P. Wesley's paper, such that it can still explain the Wave Particle problem of Electromagnetic Waves, as it is explained in that paper, and also do not violate any conclusions of Einstein's Special Relativity Theory.

The new Energy Pairs Theory predicts that Photons can embed two types of Energies, Traceable and Untraceable Energies, which are accumulated in pair which disable each other from being detected. And the Untraceable Energy embedded in Photons might also originate from Electron Positron annihilations, because that theory predicts that in such annihilation scenarios the Electric Charges of the annihilating Electron and Positron do not disappear (as it is assumed today), these Electric Charges convert into that Untraceable Energy embedded in the Photon.

The new Energy Pairs Theory also predicts, that in the inverse, Pair Production scenario, in which a Photon, in certain conditions, converts back into an Electron and Positron, the Electric Charges of these Electron and Positron are not created from nothing (as it is assumed today), they are the Untraceable Energy embedded in the Photon, which converted into the Electric Charges embedded in the created Electron and Positron.

And, because this Untraceable Energy originate from physical Electric Charges and converts back to physical Electric Charges, and also because this Untraceable Energy is Untraceable because it is accumulated in Pairs which Disable each other from being Detected, it might be argued, that this Untraceable Energy might also retain their ability to function as an Electric Dipole, as the original physical Electric Charges could act as Electric Dipoles before being converted into Untraceable Energy.

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And, on the other hand, if that Untraceable Energy Pair embedded in the Photon is just pure Energy (although Untraceable Energy) without any Mass associated to it, Photons can still travel at the speed of light, without violating Einstein's Special Relativity Theory.

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This article was inserted in the open e-Print archive viXra.org

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Please also note that the article referenced in reference [1] whose title is: "Energy Analysis of a Null Electromagnetic Wave" was also written by Moshe Segal and was also inserted in the open e-Print archive viXra.org.

That article was also published by Physics Tomorrow Letters (PTL) in the Theoretical Physics Journal. The link to that publication is:

https://2edd239a-21aa-41cc-a45e-84832f36b982.filesusr.com/ugd/04176b_f8d75fc7c61d455d8bda102055d6b92d.pdf

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