

A New Model of the Electron that Unifies Classic Physics with Quantum Mechanics

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Abstract

The objective of the Article is to postulate that the physical structure of a free electron's magnetic field is not that of a dipole magnetic field. In addition, this article will demonstrate a new model of the electron based upon an electron current within a metal conductor, furthermore how this new model can be incorporated into quantum nature of matter and energy.

Preface

In order to appreciate this article one can reference two previous articles titled, The Unification of Electromagnetism and The Earth's Magnetic Field with Permanent Magnetism and The Quantum Nature of Matter and Energy as a Function of the Ether.

Introduction

When a single free electron travels with constant velocity at a right angle with respect to a straight uniform magnetic field, there is a sideways Lorentz force. In contrast, when a solenoid electromagnet or alternatively a permanent magnet travels with a velocity, at a right angle to a straight uniform magnetic field, moreover with its poles oriented anti-parallel to that field, there is no sideways Lorentz force. What is more, presuming the magnet's dipole field is not oriented parallel or anti-parallel, then there will be rotation of the entire magnet, but again no sideways Lorentz force. Obviously, the magnetic field associated with a dipole electromagnet or permanent magnet is nothing like the magnetic field generated by a moving "free electron". Commit this idea to memory for it will be re-explained in greater detail later on within the final section of this paper.

From a perusal of the literature, I cannot ascertain how the dipole model of the electron was developed, apart from an extrapolation of the standard theory of permanent magnetism. Or else from the observation that a free electron traveling at a right angle with respect to a straight uniform magnetic field is deflected sideways, either + 90 or else -90 degrees.

With reference to the classical interpretation, the above dichotomy of the Lorentz force is indicative of two types of electron spin [up or down], indicating two forms of the electron, and so two kinds of dipole fields. Nevertheless, I can find no actual experimental evidence that these opposite spinning electrons consist of a revolving particle, analogous to a spinning gyroscope possessing both a North and South Pole.

In fact with reference to one description the electron spin is a quantum attribute which cannot be visualized.

A central objective of this Article is to demonstrate that the shape of a free electron's magnetic field is not that of a dipole configuration. Additionally the purpose of this article is to postulate a new model of the electron based upon an electron current located within a straight wire metal conductor. Furthermore this article will demonstrate how this new representation is compatible with both classic physics as well as Quantum Mechanics.

For ease of understanding and comprehension this paper will be divided into four sections.

- Section 1 describes the conventional explanation for the production of the dipole magnetic field produced by a solenoid electromagnet along with the Earth, moreover how they both represent the exact same process.
- Section 2 describes the classic theory for the production of the dipole magnetic field produced by a permanent magnet, what's more an alternative postulate which gives explanation to why a permanent magnet is analogous to a solenoid electromagnet. For that reason the dipole field model of the electron can be discarded furthermore replaced.
- Section 3 illustrates a new field model for the electron's physical structure based upon an electron current located within a straight wire metal conductor
- Section 4 describes the quantum nature of matter and energy, furthermore how the proposed new model of the electron relates to that nature.
- Section 5 revisits the introduction of this paper. Therefore by using the concepts depicted in sections 1 thru 4 it illustrates the reason why a moving free electron's magnetic field is structurally unlike that of a dipole magnet. Accordingly its interaction with a straight uniform magnetic field is distinct from a dipole magnet.

Section 1

Classical Explanation of; An Electromagnet

A straight wire conductor with an electron current produces a circular magnetic field not only surrounding the wire, but also within the substance of the wire [left hand rule]. In addition if the conductor is made into a solenoid, then the shape of the magnetic field is that of a classic electromagnet possessing both a North and South Pole, comparable to a dipole field of a permanent magnet [image 1].

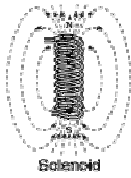


Image 1

hyperphysics.phy-astr.gsu.edu/hbase/magnetic/elemag.html

The Earth's Magnetic Field

Purportedly, the Earth's magnetic field is the result of numerous very large similarly oriented circular electron currents, located within multiple eddy flows of molten material, found deep within the Earth's crust, or alternatively within the outer portion of its molten core. In essence, this model is analogous to multiple extremely large "solenoid electromagnets, the sum of which produces the Earth's general magnetic field [image 2].

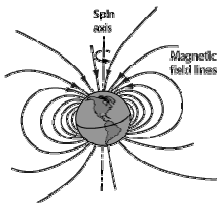


Image 2

hyperphysics.phy-astr.gsu.edu/Hbase/magnetic/MagEarth.html

In summary

Observe; the Earth's magnetic field and the magnetic field of a solenoid electromagnet are produced by the exact same process.

Section 2

1. Classical interpretation of a Permanent Magnet

In contrast, the magnetic field of a permanent magnet is hypothesized to involve an entirely different mechanism. The standard theory postulates that within the substance of a permanent magnet the unpaired outer shell electrons align in the same direction. Additionally given that each unpaired electron consists of a small dipole, then the summation of all similarly aligned unpaired dipoles creates the overall magnetic field [image 3]. Furthermore all the other randomly oriented dipole electrons, within the essence of the magnet, counteract each other, so neutralize one another thus leaving only the outer shell aligned unpaired electrons.

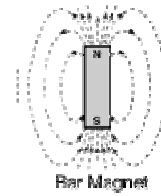


Image 3

hyperphysics.phy-astr.gsu.edu/hbase/magnetic/elemag.html

Nevertheless all is not clear-cut. As it turns out, the overall magnetic field of a permanent magnet is made up of numerous minuscule subunits called magnetic domains. Fundamentally, each domain corresponds to a small electromagnet possessing both a North and South Pole. Essentially, all of the domains combine or align to form one general magnetic field.

The domains of a permanent magnet are by and large fixed in a given orientation; consequently there is a stable unchanging magnetic field. Alternatively, within a ferromagnet they are only oriented in a specific direction in the presence of an externally applied magnetic field. However, if the external field is removed, then over time their orientations become random. As a result the ferromagnetic material loses its general magnetic field. Pictured below [image 4] are several grains of NdFeB with the magnetic domains made visible via contrast with a Kerr-microscope

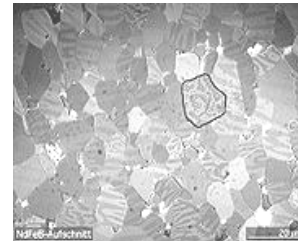


Image 4 [Wikipedia]

To recap, with respect to a ferromagnet, the domains are not fixed structures, as they are malleable. For instance, each domain consists of similarly aligned electrons. Furthermore under the influence of an external magnetic field, each domain can incorporate into its structure additional electrons, consequently it grows physically larger. At the same time, the domains reorient parallel to the externally applied field. This process is illustrated in image 5. The blocks of arrows represent the domains. Notice; as the externally applied field increases from left to right, the domains grow progressively larger; moreover they become increasingly oriented in the same direction. Conversely, with the loss of influence of an external field, [right to left] they lose electrons so become physically smaller, moreover simultaneously assume a more random orientation. This pliability is much more apparent in ferromagnetic material compared to a permanent magnet.

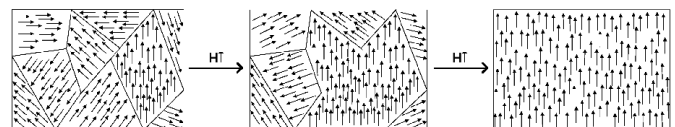


Image 5 [Wikipedia]

2. Alternative Model for the Production of the Magnetic Field by a Permanent Magnet.

This new theory proposes that the magnetic domains are composed of “crystal like groups” of unpaired outer shell electrons traveling in a circular pattern. Like the standard theory they can add or lose electrons depending upon external influences. Therefore they can change their size, shape, and orientation under the influence of an externally applied magnetic field or else from other adjacent domains. In contrast the domains of a permanent are fixed in a given direction.

In other words, the new model posits that the magnetic domains are actually stacks of parallel circular superconducting electron currents, to some extent analogous to a solenoid electromagnet. For instance, the outer shell unpaired electrons within each domain traverse from atom to atom in a circular manner; thus producing a circular electron current. What’s more, the individual circular units are stacked one on top of another; just as multiple permanent ring magnets will stack one on top of the other, assuming similarly oriented poles. Again, the ferromagnet’s “solenoid like” superconducting units are malleable; so they change under external influences, as a result no enduring general magnetic field. Alternatively the domains of a permanent magnet are fixed, consequently a persistent overall magnetic field

In summary each domain of a *permanent magnet* consists of stacks of parallel circular superconducting electron currents, somewhat analogous to a solenoid electromagnet. Additionally most of the domains are oriented permanently in the same axis. For that reason, there is a persistent general magnetic field, which is called a permanent magnet.

Now what verification do we have that this model is accurate? To help demonstrate this evidence the following five images of magnetic fields are illustrated.

- A permalloy [permanent magnet]
- A straight wire conductor
- A wire loop conductor
- A permanent magnet
- A solenoid



Imagine 6 illustrates of the shape of a magnetic field of a Permalloy. This image is from the book titled; *The Quantum World Unveiled by Electron Waves* by Akira Tonomura, page 77.

- Image 6 demonstrates the shape of the magnetic field located within a Permalloy. Note; a Permalloy is analogous to a permanent magnet. Observe; there are multiple circular shaped magnetic fields surrounding a central hub, furthermore these individual units are positioned adjacent to one another.

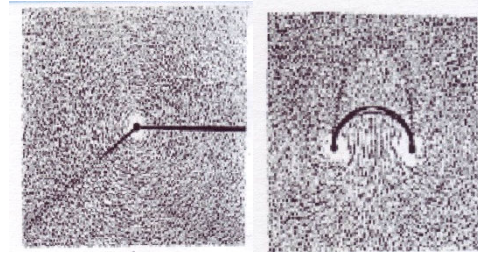


Image 7 [left] illustrates the shape of a magnetic field produced by a current within a straight wire conductor [Wikipedia]. Image 8 [right] illustrates the shape of the magnetic field of a loop current [Wikipedia].

- Image 7 demonstrates the induced circular magnetic field surrounding a current located within a straight wire conductor. Notice; Image 7 is analogous to the individual units of image 6
- Image 8 illustrates the magnetic field surrounding a single wire loop conductor with a current. Once again notice the similarity of this image compared to image 6, whereby there are multiple circular magnetic fields positioned side by side, each surrounding a central core.

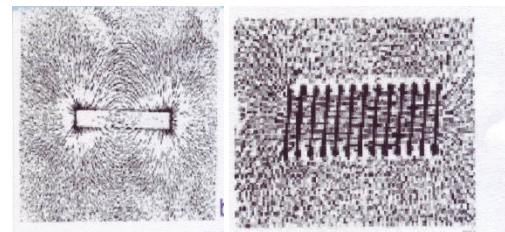


Image 9 [left] demonstrates the dipole magnetic field of a permanent magnetic field [Wikipedia]. Image 10 [right] demonstrates the shape of the magnetic field of a solenoid magnetic field. [Wikipedia].

- Images 9 and 10 demonstrate the dipole magnetic field of a permanent magnet [left] and the dipole magnetic field of a solenoid electromagnet [right]. Observe the similarity.

The Logical Bases for This New Theory

1. Now, imagine a longitudinal cross section of the solenoid electromagnet as illustrated in Image 10 [right]. In addition, with regards to this particular cross section, envision in your mind one side of the wires pictured head on, including the currents and associated magnetic fields. If so, then one will envisage multiple circumferential magnetic fields, located side by side, each surrounding a central core analogous to image 6. As a result presuming comparable magnetic field structures, this also may be indicative of equivalent processes.
2. What is more both a metal conductor and a permanent magnet possess unpaired outer shell electrons, again analogous to each other. Again comparable outer shell electron structures often correspond to similar functions.
3. If you think about it, the domains of a permanent magnet are analogous to very small electromagnets or else bar magnets. So these minute entities could be constructed from similarly aligned outer shell unpaired electrons as

hypothesized by the classical model for bar magnets or alternatively small electromagnets produced by circular electron currents. If this is not the case, then what other choice is there. In essence these alternatives are the only two possibilities.

For these three reasons, this new theory postulates that each domain of a permanent magnet consists of stacks of parallel circular superconducting electron currents, akin to a solenoid electromagnet. Even so, although these two scenarios are similar they are not identical. For example,

- A solenoid electromagnet is constructed from of a single continuous spiral circumferential wire. Alternatively, the domains of a permanent magnet consist of individual units of circular electron currents positioned one on top of the other, comparable to a stack of coins.
- A solenoid electromagnet is not typically superconducting. In contrast with reference to a permanent magnet, given that no energy is added to the system, moreover because there is no production of heat, then the electron currents within the domains must necessarily be self sustaining, therefore superconducting at room temperature. This form of superconductivity would be unlike the classical superconductors in view of the fact that it does not expel the internal magnetic field nor is it produced by Cooper pairs.
- The magnetic field lines within a permanent magnet are entrained, since they pass through multiple extremely compact "solenoid like" loop currents, not only positioned on top of one another, but also situated closely side by side. For that reason, the magnetic field lines located within a permanent magnet are significantly denser compared to an electromagnet, because the latter does not trap the field lines as much, as its central core consists mainly of air [image 9 versus image 10].

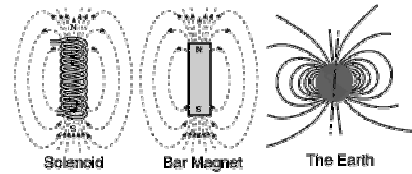
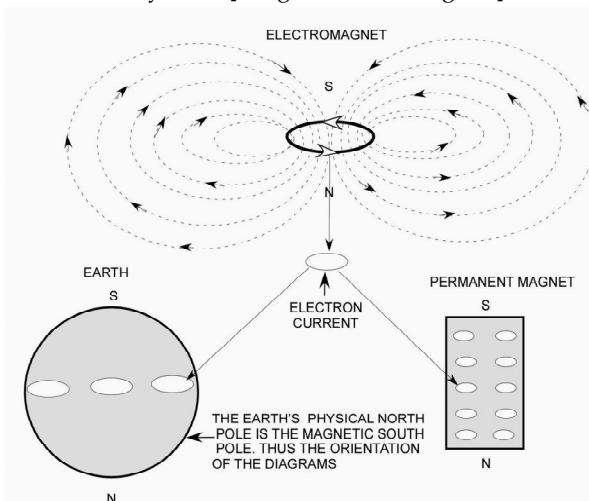


Image 11

hyperphysics.phy-astr.gsu.edu/hbase/magnetic/elemag.html

In summary

If one assumes this new premise is correct, then the electron dipole model for the production of the magnetic field by a permanent magnet can be discarded, what's more replaced by this new theory. Therefore this makes the production of the magnetic fields produced by a solenoid electromagnet, by the Earth and from a permanent magnet, all one and the same [image 11].

Section 3

The Structural Shape of the Electron

If the above alternative hypothesis is correct, then the dipole model of the electron, as well as other models may well be erroneous. Once more I can find no actual experimental evidence that the spin of an electron consists of a revolving particle, analogous to a rotating top with a North and South Pole. With reference to the literature there are multiple representations for the electron's physical structure. However each is a function of different theory, such as the classical dipole model of a permanent magnet, and the electron cloud model of quantum mechanics, which by the way are incompatible with one another.

Einstein's Relativity presumes there is no Ether, which then leads to irrational concepts, such as the twin paradox problem as well as the quandary of simultaneity. In contrast, my previous published papers [The Proceedings of the Natural Philosophy Alliance [2006] Vol. 2 No. 2 pp. 282-297] utilized the concept of the Ether to hypothesize an alternative form of Relativity much easier to visualize, moreover consistent with common sense reality whereby these irrationalities no longer exist.

In the same way, it is much simpler to illustrate this new model of the electron presuming the existence of the Ether. For that reason, the following attributes concerning the nature of matter and energy as a function of the Ether are listed. These attributes are used later on within this section to illustrate the physical field structure of the electron.

- Electromagnetic radiation [EMR] consists of a wave of the Ether traveling through itself, to some extent analogous to how water waves traverse through water. In addition EMR is constructed from alternating right angle electric and magnetic fields moving through the Ether at the velocity of c , furthermore in packets called photons [See image 12.

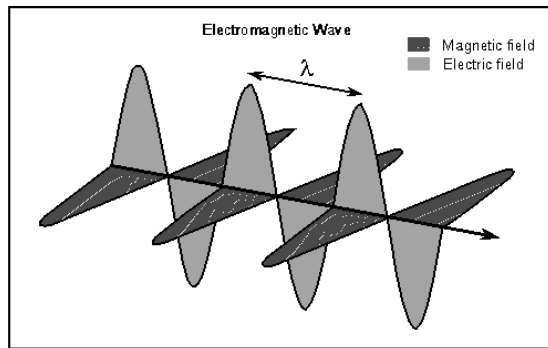


Image 12 from Wikipedia

- [See image 13] An electron [matter] is essentially a reorganization of the electric and magnetic fields of EMR. In other words, EMR's linear momentum traveling through the Ether at velocity c is converted into angular momentum, due to the fact that it spins upon itself, thus transforming into an electron [with spin], nevertheless now at rest or near rest with the Ether. In addition, the EMR's electric and magnetic fields rearrange, to form a central spherical radiating electric field surrounded by a circular magnetic field as illustrated in image 13.

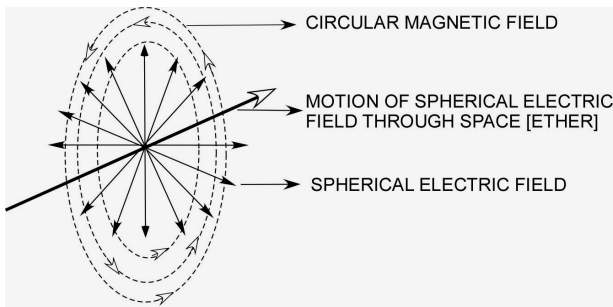


Image 13

The electron is constructed from only a spherical central radiating electrical field along with a circular magnetic field, the latter oriented perpendicular to its motion through space [Ether]. There is no particle, rather only fields.

- What's more, this transformation only occurs with respect to a precise packet of energy [e.g. .511 Mev.] or in other words a quantum. As a speculation the direction of the spin of the EMR [photon] as it transforms into an electron, could be related to the direction of the spin of the electron [e.g. up or down].
- The electron is not a particle with associated fields; rather the fields are the electron, just as EMR consist of only fields. The notion of a particle is only a *perception*, which occurs when the fields of an electron interact with the fields of other electrons, protons or photons at a specific location. This interaction with a detector at a given location is perceived by the observer as a particle
- All other subatomic structures [protons, anti-electrons quarks ect.] are constructed from electromagnetic radiation, since they too are interchangeable with EMR.
- To recap; the constituents of matter; [electrons, protons and quarks ECT] can morph into electromagnetic radiation and

vice versa. In essence both matter and EMR are constructed from the same electric and magnetic fields, though with a different arrangement, along with a dissimilar velocity with respect to the Ether. In addition this transformation occurs in given packets of energy. For example given the proper circumstances a .511 Mev photon [EMR] traveling through space at c , curls and spins upon itself, thus transforming into a spinning electron at rest with the Ether. Because this bidirectional transformation occurs only at specific values of energy, moreover in packets, it is then a part of QM.

- When an electron and proton attract one another, due to their opposing electric fields to form an atom, their magnetic fields also interact, moreover in a very complex manner. Additionally the electron's opposing spins, within the orbital shells, generate opposite magnetic fields, so this is a part of the interaction as well. For all these reason, the electron [or electrons] does not orbit the proton [nucleus] analogous to how a planet orbits the Sun. Instead it orbits the nucleus in a "random like" orbital pattern.
- This new model further hypothesizes that the complex interacting fields, created by all of an atom's proton and electrons are in a stable state of equilibrium, which is what holds them together and produces that atom. Alternatively all other states are unstable, so in that latter setting the atom decays into a new equilibrium point. What is more, different elements possess other stable equilibriums points. These dissimilar stabilization points represent the quantum nature of matter.
- In the same way molecules as well as other larger structures are stable equilibrium points involving very large numbers of atoms. For example the stable equilibrium state of a magnetic domain includes its functioning superconducting circular electron current. In fact what we assume as life is in fact an extremely large and complex equilibrium point of a massive number of atoms including all of its functions.
- And so matter is ultimately a product of the Ether. What all this means is that space, a vacuum, or what we consider "nothing at all" is in fact by far the most fundamental "stuff" of the Universe. Now if the "stuff" or else Ether becomes a wave that travels through itself at a velocity of c , we call it electromagnetic radiation. In addition, if at certain fixed units of energy instead of traveling through itself with linear momentum, it curls upon itself, moreover spins with angular momentum, then it transforms into matter [e.g. electrons]. Fundamentally, the matter of the Universe is constructed from what the majority individuals would consider as "nothing at all", or in other words, the term Ether. Incidentally, the term Ether makes more sense, given that it signifies something rather than nothing.

Given these assumptions, let us now return to the new proposal for the morphology of the electron. But first in order

to understand this concept, one needs to recognize the following facts. Subsequently to this the rational for the physical structure of the electron will be proposed.

1. When an electron current passes through a straight wire conductor, it induces a circular magnetic field not only surrounding the wire, what's more for that matter within the substance of the wire as well. Note by definition a current is a flow of positive charge, whereas an electron current is a negative flow, as illustrated in image 14 [left hand rule].

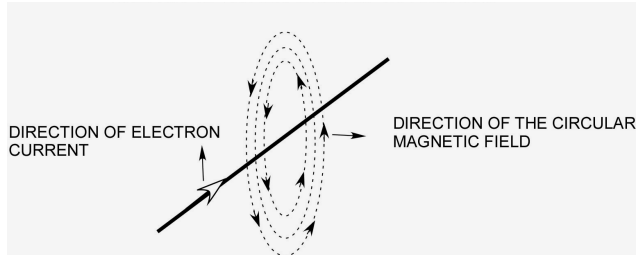


Image 14

On one hand, the current traverses extremely slowly within the conductor. On the other hand, the wave front of the magnetic field travels along the wire length exceedingly fast, in all probability close to the speed of light. This process is clearly illustrated by this narrative. The first electron within the conductor strikes an adjacent electron. In turn, that second electron bumps into the adjoining electron, yet again in the direction of the current and so on, until the whole conductor is involved. This is analogous to a single line of pool balls, whereby an eight ball strikes this line head on. As a result, the impulse of momentum is transferred along the line; although with only minimal movement of each ball. For example, when the eight ball strikes the first ball head on, its momentum is transferred to that ball. In turn, that first ball transfers its momentum to the second ball, and so on, until the last ball of the line. Since the last ball receives its momentum from the next to the last ball, and because there is no other ball to strike, it leaves the line with a velocity identical to the incoming eight ball. This is assuming no friction as well as inelastic collisions. With reference to this analogy, the minimal physical movement of the pool balls along the line is analogous to the extremely slow velocity of the electron current, whereas the impulse of momentum corresponds to the rapid velocity of the magnetic wave front as it travels along the conductor.

2 Now according to Einstein an electron at rest with the observer consists of only an electric field. Alternatively an electron possessing a velocity relative to the observer contains both an electric field and a magnetic field. Furthermore the greater the electron's velocity with respect to the observer, the greater is its magnetic field until they become equal at the speed of light.

3. As a corollary, assuming the existence of the Ether, then an electron at rest with the Ether consists of only a spherical electric field. And an electron traveling with a velocity relative to the Ether possesses a circular magnetic field as well. Again the greater its velocity, the greater is the magnetic field until

they become equal at the speed of light, once again with respect to the Ether. What's more, and this is new, the plane of the magnetic field is oriented perpendicular to its direction through space [Ether].

4. Furthermore, taking into consideration this new theory, this last concept will be modified. As a result, an electron at rest with the Ether possesses both a central spherical electric field as well as circular magnetic field as previously hypothesized. Fundamentally this is the rest configuration of the electron [rest mass]. What is more, this primary magnetic field is perceived by physicists as the electron's magnetic moment, even though not analogous to a spinning gyroscope. On the other hand when the electron possesses a velocity relative to the Ether, then the primary magnetic field increases, furthermore it reorients, so that its plane is perpendicular with respect to its motion through space [Ether]

My previously paper titled Inflowing Space [An Alternative to GRT] published papers in The Proceedings of the Natural Philosophy Alliance [2006] Vol. 2 No. 2 pp. 282-297 hypothesized that the velocity of inflowing space at the Earth's surface is 11.2 Km/sec. With reference to that paper, the inflow of space or in other words inflowing Ether is the preferred frame. For future reference within this paper the physical inflow of space relative to the Earth's surface will be defined as the Ether.

The Rational for the Physical Structure of the Electron

Consequently assuming the validity of this inflowing premise, as well as all of the other given premises and attributes, then within a metal conductor absent a current, at the Earth's surface, all of the electrons and protons possess the exact same velocity relative the inflowing Ether. Given that the conductor is constructed from an equal numbers of electrons and protons, furthermore since they possess opposing magnetic fields [including their opposite spinning electrons] then as a whole these diverse fields counteract one another. In addition, the opposing electric fields negate one another as well. As a result, relative to this reference frame, a conductor absent a current possesses neither an overall magnetic or overall electric field.

In contrast, when an electron current exists within the conductor, then with respect to the Ether, these specific electrons possess a greater relative velocity than the protons, consequently a *relative* increased magnetic field compared to the protons along with the other electrons. What is more, all the electrons of the current are traveling along the same path, whereas the protons and the other electrons taken as a whole have no direction. For these two reasons, the opposing magnetic fields of the electrons and protons, that previously neutralized one another, now no longer counteract one another. So, at this time there is an overall magnetic field; moreover this field is a function of only the electron current. Again recall within the conductor there is still an equal number of electrons and protons; as a consequence no general electrical field, rather only an overall magnetic field.

1. Fundamentally, and this is important, the overall shape of the magnetic field associated with an electron current is the summation of the magnetic field from each electron of that current.
2. Furthermore the electric fields of both the electrons and protons must necessarily be spherical in nature since the affect of these fields upon other electric fields is symmetrical in all direction.

For these two reasons the shape of the two fields of the electron is illustrated in image 15.

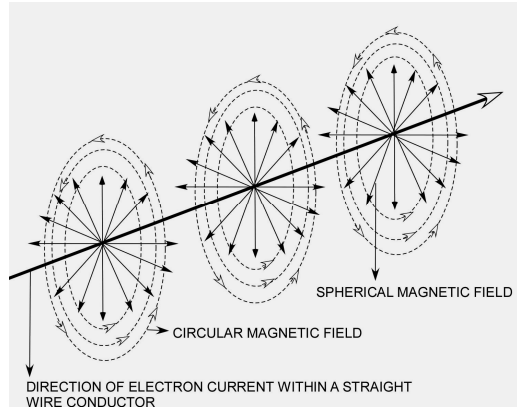


Image 15

With reference to a single straight wire conductor possessing an electron current, the summation of all the magnetic fields produced by each individual electron of that current is what creates the classical circular shaped magnetic field around the conductor. Note; within the conductor there are an equal number of electrons and protons, therefore there is no overall electric field because the opposite and equal electric fields neutralize one another. Alternatively, there is an overall magnetic field since the opposing, moreover unequal magnetic fields do not counteract one another

While we're on the subject, in order to comprehend this postulate the premise of the inflowing ether is not necessary. Essentially all one need to be aware of is that within a metal conductor, without a current, the opposing electric fields of the protons and electrons counteract one another. In addition the magnetic fields created by the protons and electrons, including their opposite spins, also neutralize one another. As a result within a conductor absent a current there is no overall electric or magnetic field

Alternatively, when an electron current is present within the metal conductor, then the electrons of that current possess compared to the protons and other electrons a relative velocity. Furthermore they are all aligned and traveling along the same path. As a result, the previous negating anti-symmetry involving opposing magnetic fields is lost. In essence, the opposite electric fields still cancel one another; yet the opposing magnetic fields at this time do not. As a result, the only thing remaining is the circumferential magnetic field produced by the electron current.

What is more, if one assumes the plane of the circular magnetic field of an electron is oriented perpendicular with

respect to its motion through space [Ether], then the circumferential magnetic field produced by a straight wire current is the result of the summation of the magnetic field from each individual electron of that current [image 15]. Observe by using this methodology it is very easy to envisage the actual physical structure of the electron. By the way, the outer shell unpaired electrons of a metal conductor all spin in the same direction. For that reason when these electrons travel along the straight wire conductor their magnetic fields are aligned in the same direction.

In summary

The above illustration and discussions demonstrate the rational for the new field structure of the electron. All the same this model is still inconsistent with the Quantum Mechanics model of the electron. However the following section will incorporate this new field model of the electron with the quantum nature of matter and energy.

Section 4.

The Quantum Structure of Matter and Energy as Function of the Ether

This new model uses the notion that both matter and EMR consist of only electric and magnetic fields, along with the concept of the Ether to construct a modified Bohr model of the atom, which is by the way is very similar to the electron cloud model of [QM]. In other words, as illustrated in image 16, the classic Bohr Model on the left is transformed into a modified Bohr model, which is analogous to the electron cloud model of QM on the right. In essence, this section illustrates how the new field model of the electron can be incorporated into the quantum nature matter and energy

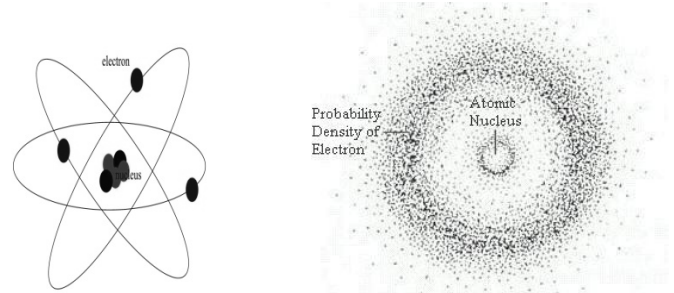


Image 16 from Wikipedia

In order to demonstrate this last concept, this theory assumes the following attributes.

- Again matter [electrons and protons] is constructed from electromagnetic radiation, moreover when given the proper circumstances, instead of traversing linearly thru space at c , curls and spins upon itself, thus transforming into matter [charged particles] with spin. This includes positively charged protons as well as negatively charged electrons which attract one another due to their opposing electric fields.
- When an electron and proton attract one another due to their opposing electric fields to form an atom, their magnetic fields

also interact in an extremely complex manner. Additionally the opposite electron spins [within complex atoms] create opposing magnetic fields, so this is a part of that interaction as well. For all these reason, the electron [or electrons] does not orbit the proton [nucleus] analogous to how a planet orbits the Sun. Instead it orbits the nucleus in a “random like” orbital pattern, once again due to extremely complex, ever changing, interacting electric as well as magnetic fields.

- An electron is constructed from only electric and magnetic fields, so there is no particle. In addition neither field is located at a precise location with respect to space. In theory these fields could extend to infinity, although this may not be factual. Regardless, the electron’s two fields are spread out over an area and volume. Essentially, there is no one specific point in space whereby one can say the electron exists, rather only a region.
- Now observe; the electron has no precise point location with respect to space [Ether], nor does it have a given specific orbital path, rather only “random like” orbital motion. Therefore one can experimentally determine only a probability of the electron’s location, seeing as it is spread out over a region. Similarly one can experimentally determine only a probability of orbital velocity since the electron possesses no specific orbital path velocity, as its orbital motion is essentially random. Observe this concept is analogous to the quantum wave functions of QM.
- In addition, one can envision this field model of the electron orbiting a proton, [nucleus] integrated over a short interval of time, as a cloud surrounding the nucleus [proton], just like the electron cloud model of QM. As a result by using these assumptions the classical Bohr Model transforms into the modified Bohr Model, which is analogous to the cloud model of QM. Again, the new representation of the electron is also consistent with the quantum nature of matter and energy.
- This new model further postulates that the complex interacting fields, created by all of an atom’s proton and electrons are in a stable state of equilibrium. Essentially this is what holds the field structures together to form that atom. Alternatively other states are unstable, so in that case the atom decays into a new equilibrium point. Additionally different elements are associated with other stable states of equilibrium. What’s more the equilibrium points for some elements are extremely complex. Therefore, some elements form odd configurations, such as a donut or a bar bell, yet again just like QM [see Image 14]. Incidentally the different de Broglie wavelengths of the orbiting electrons are a part of the stable state of equilibrium. .

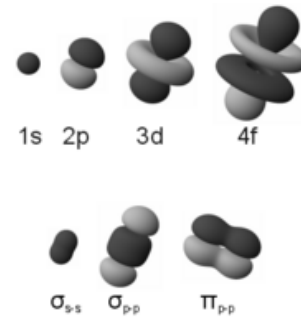


Image 17 from Wikipedia

- This same model is also applicable to protons, neutrons as well as quarks. For example, each subatomic unit of the nucleus possesses its own electric field, magnetic field as well as the strong force field. All these complex fields interact with one another to form the nucleus, again only with respect to specific stable equilibrium points. This makes more sense if one assumes that the quarks orbit each other, or in other terminology the protons and neutrons orbit each other. Basically these stabilization points associated with different numbers of protons, neutrons [quarks] represent the elements.
- However recall, some elements decay into other elements. So in this scenario the equilibrium state for that specific type of atom is not absolutely stable over time. For example generally the complex interacting fields produced by the subatomic structures are stable. Nevertheless, very rarely over time, as they interact, the total configuration assumes an unstable form. When this occurs, a subatomic unit, a photon, or both is ejected from the nucleus. At the same time, the remaining nuclear subatomic structures [fields] reassemble to form a new stable equilibrium point. Once more this concept is consistent with QM.
- Both this new theory and QM involve quanta; as illustrated below.

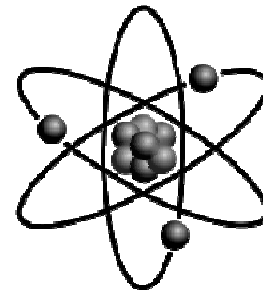


Image 18 from Wikipedia

The electrons and protons [quarks] of the atom are produced from discrete packets of EMR called photons and vice versa [quanta]. Furthermore the atom forms because of very complex interactions involving all of the electric and magnetic fields, which are only stable at given equilibrium points. Observe these diverse stable equilibrium points represent the different types of atoms along with quantum nature of matter.

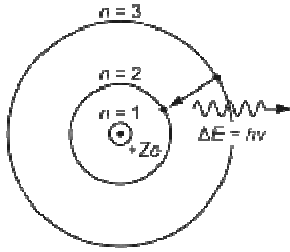


Image 19 from Wikipedia

If an electron drops from an outer shell into a middle shell equilibrium state, it surrenders some of its magnetic field in the form of an emitted packet called a photon. Conversely when an electron in an inner shell absorbs a packet of EMR called a photon it jumps into an outer shell. Again note these are quantum interactions

In summary

This new model of the field structure of the electron is consistent with classic physics; more to the point as illustrated in this section it can be incorporated into a Quantum Mechanic like model of the atom.

Section 5

At the commencement of this article, it was noted that when a free electron travels with a constant velocity, moreover at a right angle with respect to a straight uniform magnetic field, there is a sideways Lorentz force. Then again, when a permanent magnet travels with a constant velocity, at a right angle to a uniform magnetic, what's more with its poles oriented ant-parallel to the uniform field, there is no sideways force. This illustration was used to demonstrate the rational for why the magnetic field of a free electron differs structurally compared to a dipole field of a solenoid electromagnet or else a permanent magnet.

Now let us assemble the assumptions and postulates presented in sections 1 thru 4 into a concept which explains these two observations, although in much greater detail.

The Electron

This theory assumes that when the plane of an electron's circular magnetic field is oriented perpendicular to a linear uniform magnetic field, there is no interaction of the two fields, and so no force. In contrast if the plane of an electron's circular magnetic field is oriented parallel to a linear uniform magnetic field, then the two fields interact, and generate a sideways Lorentz force. Furthermore the direction of the sideways Lorentz force is a function of the direction of spin of the circular magnetic field around the electric field.

If so, then:

- An electron at rest with respect to a straight uniform magnetic field experiences no linear force, because in this case the electron's circular magnetic realigns, so that its plane is then oriented perpendicular to the direction of that field. In this scenario the two fields do not interact

linearly, consequently there is no force producing linear motion. However there is still possible rotational motion from torque, yet no linear motion from force.

- When an electron possesses a velocity parallel to a straight uniform magnetic field, then as it traverses through the ether, the plane of its circular magnetic field is oriented perpendicular relative to the direction of that uniform field. Again there is no interaction of the two magnetic fields, and so no force. Accordingly the electron's velocity remains unchanged
- When an electron possesses a velocity, at a right angle with respect a straight uniform magnetic field, then as it traverses through the ether, the plane of the electron's magnetic field is oriented parallel to that uniform field. Now in this setting, the two fields will interact to generate a sideways Lorentz force, furthermore in one of two directions depending upon the spin of the electron's circular magnetic field [up or down]. This results in two potential opposite sideways Lorentz's forces, each a function of the direction of the electron's circular magnetic field. Even so there is no change in the electron's speed, rather only a change in its direction. This dichotomy of motion is perceived by many physicists as the dipole moment of the electron [or spin] even though there exists no spinning particle.

Dipole magnet

Recall from previous discussions in section 2, that the circular currents located within a permanent magnet's domains are a part of a stable state of equilibrium. Consequently the domains orientations are fixed, and in general not affected by an externally applied uniform magnetic field. As a result, the entire domain with its dipole field interacts with that external field, rather than the individual electrons of the domain. This is only a simplified model of this concept, nevertheless useful in illustrating this concept.

For that reason, when a permanent magnet or else a solenoid electromagnet magnet is in the presence of a straight uniform magnetic field, then the entire physical magnet aligns so that its dipole field is oriented in the opposite direction relative to the uniform field [torque]. Even so, there is no force producing linear motion, such as the sideways Lorentz force. As a result, a dipole magnet at rest with respect to linear uniform field remains at rest, apart from for possible rotation. What is more a dipole magnet possessing a velocity relative to the uniform field remains unaffected, again except for possible rotation.

Conclusion

First, this article demonstrates that the magnetic field of a free electron is not that of a dipole configuration. Rather the electron is composed of a central spherical radiating electrical field surrounded by a circular magnetic field. Furthermore the plane of the magnetic field is oriented perpendicular with respect to its motion through the Ether. What is more, as the

velocity of the electron increases with respect to the Ether, then the greater is its magnetic field.

Second this paper integrates the new field model of the electron with the quantum nature of matter and energy, the latter somewhat analogous to Quantum Mechanics.

Finally this paper illustrates the underlying physical mechanism which explains why a free electron behaves differently compared to a dipole magnet, as it interacts with a straight uniform magnetic field. This in turn again illustrates that an electron is not a dipole structure.