the general science journal

Mr Casey Ray McMahon, B.Sci (Hons), B.MechEng (Hons)

Lorentz and Einsteins Maxwell-Hertz transforms for transverse and longitudinal mass- Explained with McMahon field theory

Abstract: Here, I use the McMahon field theory to Explain the meaning of the transverse and Longitudinal mass values obtained by Lorentz, and Einstein in his paper: **Einstein,A. (1905)** *On the electrodynamics of moving bodies.* June 30, 1905. Annalen der Physik. **322** (10): 891–921. The McMahon field theory allows us to see what these equations mean.

Theory:

Special relativity applies to particles or masses moving close to the speed of light, which is the case for electrons moving as electrical current in a wire, as shown in the paper: **McMahon, C.R. (2015)** *"Electron velocity through a conductor*". Thus, special relativity applies to such particles, which allows us to observe special relativity in the real world as the magnetic field. Thus, through the magnetic field, McMahon field theory explains that particles moving near the speed of light appear as energy fields.

First, allow me to present a new understanding of energy, as already presented in McMahon field theory: Theoretical unification of relativity and quantum physics, thus methods to generate gravity and time. (2010).

This theory begins explaining the nature of light using an example of electrons moving through an electrical wire. Since the velocity of these electrons can be considered as at or near the speed of light, we can assume that they are affected by both time dilation and length contraction, effects predicted by Albert Einstein's famous theory of relativity.

Let's perform a thought experiment: Let's imagine a stretched out spring. Let the straight stretched out spring represent the path of electrons moving in an electrical wire. Now, since length contraction occurs because of relativity, the electron path is affected. As a result, the straight line path of the electron is compressed. This is the same as allowing a spring to begin to recoil. As a result, the straight line path of the electron begins to become coiled. I call this primary coiling. This is the effect length contraction has on mass as is approaches the speed of light and is dilated by length contraction. When a particle such as an electron reaches the speed of light, it becomes fully coiled or fully compressed, and Einsteins length contraction and time dilation equations become equal to zero and "undefined". This particle, now moves as a circle at the speed of light in the same direction it was before. If this particle tries to move faster still, it experiences secondary coiling. Ie: the coil coils upon itself, becoming a secondary coil. This is why energy is observed on an Oscilloscope as waves: we are simply looking at a side on view of what are actually 3-dimentional coiled coils or secondary coils. Waves are not simply 2 dimensional; rather, they are 3 dimensional secondary coils. It was easy for scientists of the past to assume waves were 2 dimensional in nature, as the dimensional calculations and drawings for relativity were carried out on flat pieces of paper which are also 2-dimentional. The human imagination, however, is able to perform calculations in multiple dimensions. Now, let's consider the effect of time dilation.

When an electron approaches the speed of light, according to relativity, it undergoes time dilation. What does this actually mean? I believe this is the effect: time dilation allows a body, particle or mass- in combination with the effects of length contraction, to exist in multiple places at the same time. This is why we observe magnetic flux. Electricity is composed of high speed electrons, so these electrons would be affected by time dilation and length contraction. As a result, the electron is both inside the electrical wire, and orbiting around the wire as magnetic flux (because of full primary coiling at the speed of light). Magnetic flux is the combined effect of length contraction and time dilation on the electron. The coiling effect is why electrical wires carrying electricity exhibit magnetic fields- the electron path is compressed into coils, and time dilation permits the electron to occupy multiple positions at the same time, which is why magnetic flux is detected as coils at different distances from the electrical wire. Please refer to figure 1 on the following page.

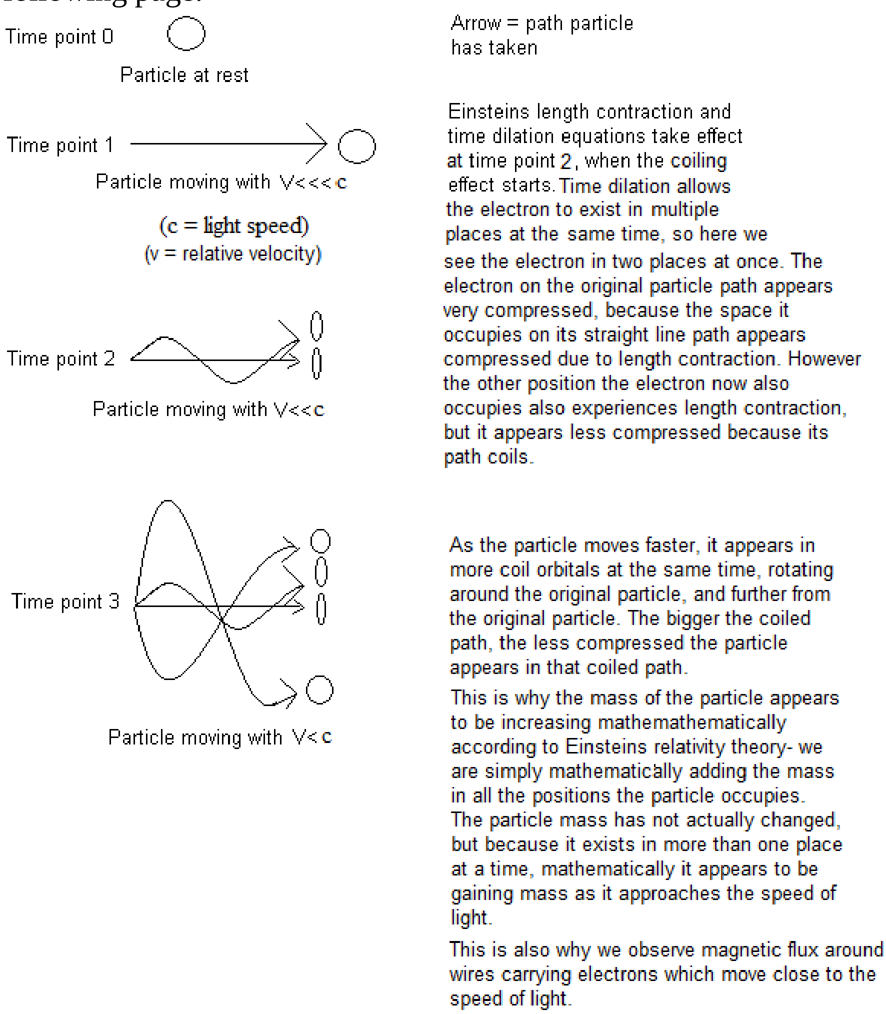

Figure 1: particle relativity- Taken from the McMahon field theory (2010): What we observe as relative stationary observers of a particle as it travels faster.

However- the McMahon field theory goes on to explain much more, including the electromagnetic spectrum- hence light, which I will briefly cover now. Refer to figure 2 below:

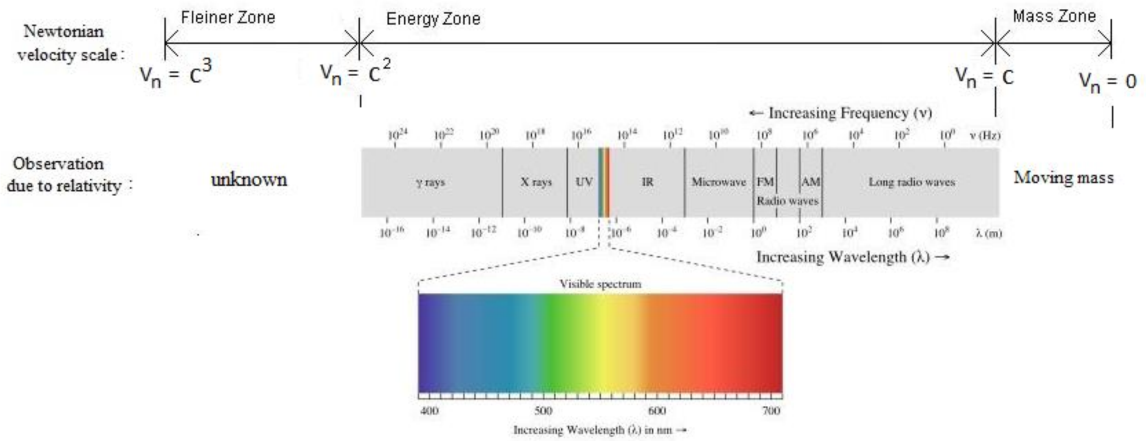

Figure 2: How an electron is observed at different Newtonian speeds: modified from the McMahon field theory (2010): Here, we see that as an electron moves with increasing speed according to Newtonian physics (although the speed we observe is dilated back to that of light because of relativity as in figure 4) and becomes a coil because of relativity, as the electron speed is increasingly dilated back to light it is observed as different types of energy. This is because the electron becomes more coiled (more velocity dilation) as it tries to move faster, so we say that the frequency increases and wavelength decreases. In this diagram, let the value of true, un-dilated Newtonian velocity due to relativity be Vn as in figure 4, and let the velocity of light be equal to c. I believe that electrons are on the boarder of mass and energy, so in the diagram above electricity would be at the point where Vn=c. If the electrons in electricity tried to move faster, they would be compressed further into a secondary coil to become long radio waves, then AM radio waves, then FM radio waves, then microwaves, then Infra-red (IR), then X-rays, then y-rays. Hence, the electromagnetic spectrum is nothing more than an electron dilated by different magnitudes of relativity. <u>Other particles, such as protons and neutrons, will also have their own spectrums, which may be different or similar to that of the electron.</u>

From Figure 2, we see that if electricity or electrons in an electrical wire tried to move faster, the electrons path would be compressed further, making it coil upon itself again creating secondary coiling or a coiled coil path. Hence it would be further affected by length contraction. As a result, the electron will be observed as different forms of energy. In the figure above, we see that an electron is considered as mass when it has an undilated velocity or Newtonian velocity between 0 and c. If an electron tries to travel faster than this, it enters the energy zone, where the electron path becomes fully compressed and moves as a full primary coil or circle which undergoes secondary coiling or coils upon itself. A particle moving as energy or a secondary coil has an un-dilated velocity or Newtonian velocity range between c and c^2. In this range, the particle now experiences secondary coiling, so the coil now coils upon itself. Figure 3, taken from the McMahon field theory (2010), also explains what happens if an electron tries to move faster than C^2: The secondary coiled or coiled coil path becomes overly dilated, and the length contraction effect becomes so great that the particle now undergoes tertiary coiling- ie it becomes a coiled coil coil. As a result, because of excess coiling the particle becomes undetectable or unidentifiable. These undetectable states are what are known as dark matter and/or dark energy. See figure 3.

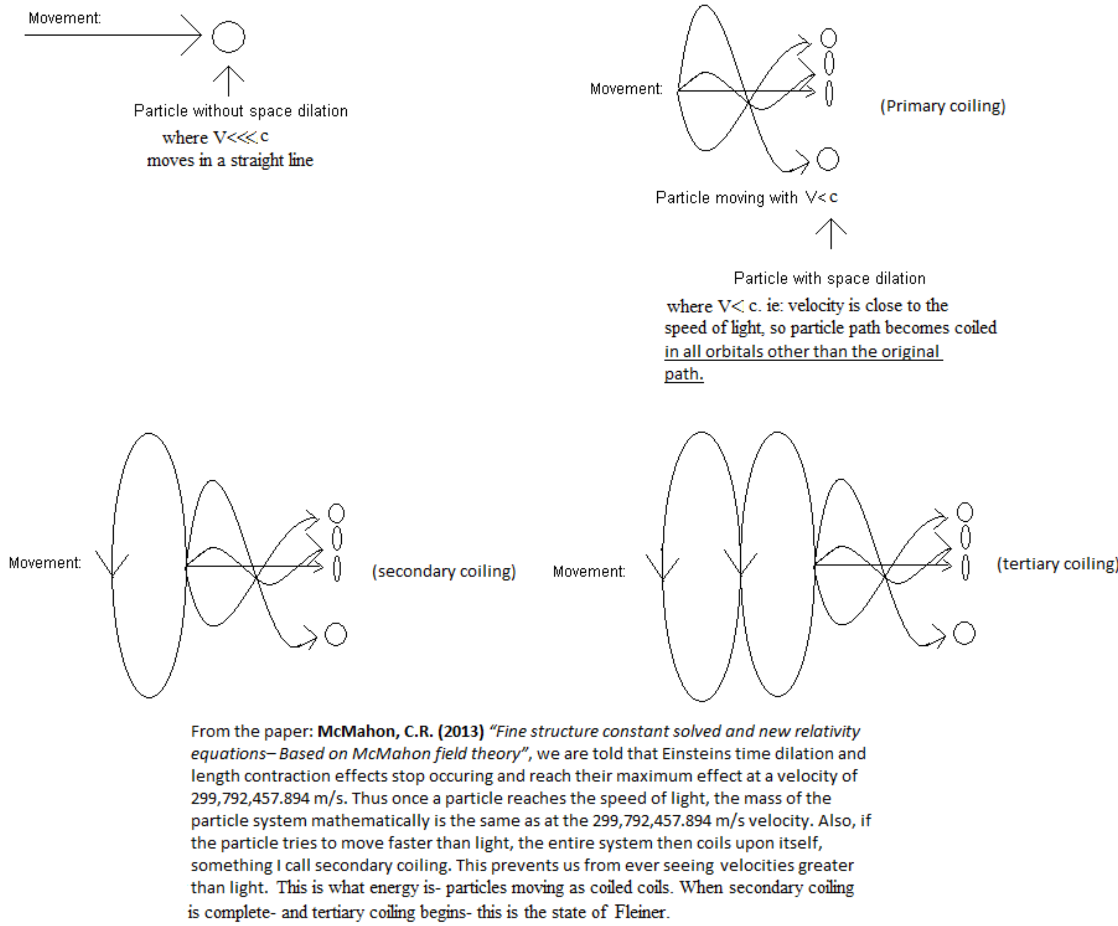

Figure 3: The actual affect Einsteins relativity theory has on the movement of a particle, causing it to first appear as mass during primary coiling, then energy during secondary coiling, and Fleiner during tertiary coiling, during which it becomes dark matter or dark energy. Einstein was unaware of this.

Now, we must consider conventional science of the current day. Conventional oscilloscopes are used for energy only. Therefore, the "waves" we see on oscilloscopes are in fact, the side views of secondary coils and higher degrees of coiling. Once full primary coiling is achieved, the fully compressed primary coil remains as it is, but with more momentum it begins to coil upon itself, which is secondary coiling. Thus, "wavelength" and "frequency" according to the science of this day are measurements from the reference point where a full primary coil forms.

Lets consider McMahon field theory (2010). From the McMahon field theory, we realize that magnetic flux arises due to the length contraction and time dilation of the electron. We observe this flux differently depending on the Newtonian velocity of the electron (ie: the electromagnetic spectrum in figure 2). Keep in mind that relativity prevents observers from measuring the true velocity (Newtonian velocity) of the electron- relativity dilates velocities greater than light back down to the speed of light. Refer to figure 4 below.

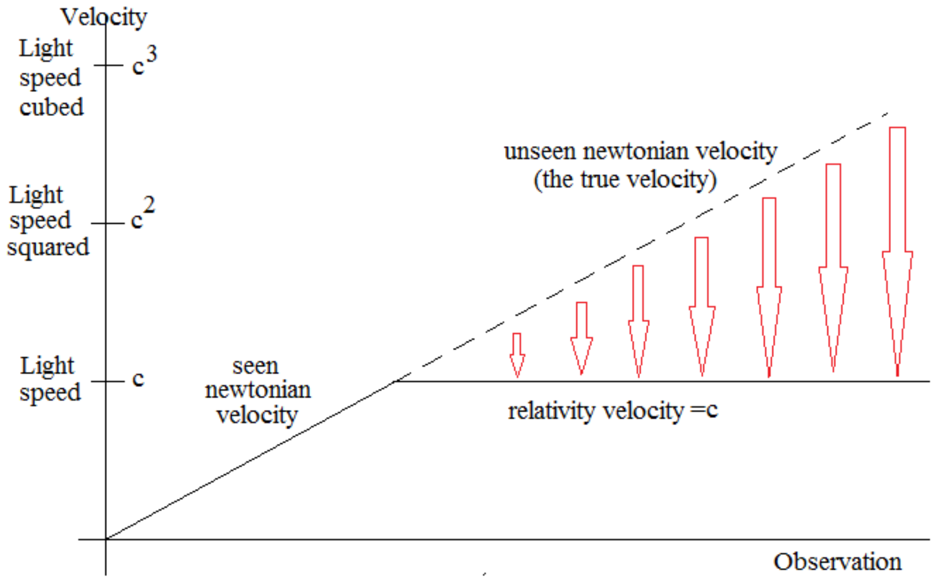

Figure 4: The dilation of the true velocity or Newtonian velocity by relativity. Here, we see that the dotted line represents the true velocity of particles travelling faster than the speed of light, but relativity dilates this velocity down to the speed of light which coils the path of the particle, so observers don't ever see particles travelling faster than light. The degree of velocity dilation is represented by the red arrows. Hence, the solid lines represent that which is seen, but the dotted line, which is the true velocity above light, is unseen due to dilation by relativity.

Now, figures 1 and 3 depict the length contraction effect on the electron, but the length contraction effect occurs simultaneously with the time dilation effect, which causes the electron to exist in multiple places along-side itself at the same time. As a result, as a particle approaches the speed of light, the original electron remains in its original linear position, but it also exists tangentially to itself, which rotates around its original self.

From figure 5 in A), we see a stationary electron in a wire. If this electron moves to the other end of the wire at speeds much less than N, or C for us on Earth, the particle obeys the laws of Newtonian Physics. In B), we see our electron now moves through the wire with a speed of c, so as discussed earlier it undergoes full primary coiling, which results in the appearance of a magnetic field (the magnetic field is the primary coiling) so it obeys the laws of relativity. From Einstein, when the electron moves at a speed where V=c, t'= undefined (time dilation = undefined) and s'= 0 (length compressed to zero). This means that to us, the particle no longer experiences time as in Newtonian physics, and now moves as a full primary coil or circle which propagates along with a speed equal to c. Because t'=undefined, the electron is able to be in more than one place at a time. Because s'=0, the particle is seen to move as a full primary coil or circle, which moves along the wire, always with a relative speed equal to c. this means that the electron is both inside the wire, and orbiting around the wire in multiple orbits multiple distances from the wire at the same time.

These "ghost or flux particles" which are all one particle that exist in different places at the same time, are responsible for the strange observations and theories made in quantum physics. These theories arise from the fact that ghost particles appear in their experiments involving high speed particles, such as the double slit experiment, and physicists cannot explain what they observe.

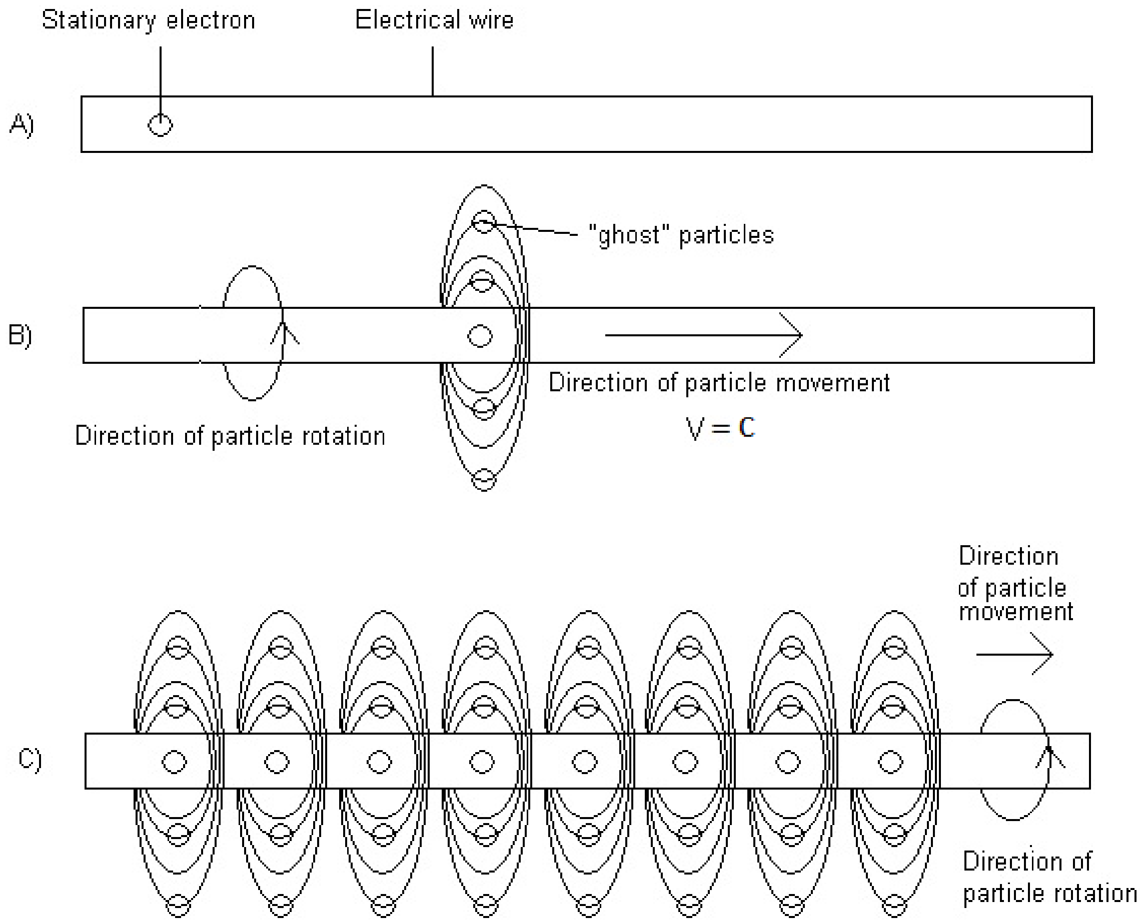

Figure 5: In A), we see a stationary electron in a wire. If this electron moves through the wire at speeds far below c, then the particle simply moves in a straight line through the wire, and no magnetic field is observed.
In B), our electron is now moving at c, so space dilation is occurring, causing the electron to now move as a circle (full primary coil) rather than in a straight line. As a result, the entire primary coil is always seen to move at a relative speed of c. However, the particle is experiencing maximum time dilation, t'=undefined. As a result, relative to us as stationary observers, the electron is in more than one place at the same time. In fact, the electron is both inside the wire, and orbiting around it in multiple orbital positions at the same time. As a result, we observe a magnetic field around the wire, which is just the electron orbiting around the outside of the wire. This is explained in section II table 1 of the McMahon field theory. When a particle is seen in more than one place at the same time, I call this a ghost or flux particle.
In C), the situation described in B) is exactly what is observed when electricity moves through an electrical wire. Note that conventional current moves in the opposite direction to electron flow.

From figure 5, we see that the original moving electrons we observe as electricity still exist inside the wire, but the length contraction and time dilation effects allow these electrons to simultaneously exist tangentially to their direction of movement outside the wire. Thus, in this case, because the electrons inside the wire move in a straight line, we say these electrons are moving mass, but when these electrons exist outside of the wires because of time dilation and length contraction as coils we call this magnetic flux.

Explanation of transverse and longitudinal mass.

From **Wikipedia (2014)** *mass in special relativity, we are told that:* "It was pointed out by Thomson and Searle that this electromagnetic mass also increases with velocity. This was further elaborated by Hendrik Lorentz (1899, 1904) in the framework of Lorentz ether theory. He defined mass as the ratio of force to acceleration, not as the ratio of momentum to velocity, so he needed to distinguish between the mass $m_L = \gamma^3 m$ parallel to the direction of motion and the mass $m_T = \gamma m$ perpendicular to the direction of motion (where $\gamma = 1/\sqrt{1 - v^2/c^2}$ is the Lorentz factor, *v* is the relative velocity between the aether and the object, and *c* is the speed of light). Only when the force is perpendicular to the velocity, Lorentz's mass is equal to what is now called "relativistic mass". Max Abraham (1902) called m_L *longitudinal mass* and m_T *transverse mass* (although Abraham used more complicated expressions than Lorentz's relativistic ones). So, according to Lorentz's theory no body can reach the speed of light because the mass becomes infinitely large at this velocity.

Also Albert Einstein initially used the concepts of longitudinal and transverse mass in his 1905 electrodynamics paper (equivalent to those of Lorentz, but with a different m_T by an unfortunate force definition, which was later corrected), and in another paper in 1906. However, he later abandoned velocity dependent mass concepts.

The precise relativistic expression (which is equivalent to Lorentz's) relating force and acceleration for a particle with non-zero rest mass m moving in the *x* direction with velocity *v* and associated Lorentz factor γ is

$$\begin{aligned} f_x &= m\gamma^3 a_x = m_L a_x, \\ f_y &= m\gamma a_y = m_T a_y, \\ f_z &= m\gamma a_z = m_T a_z." \end{aligned}$$

………. equation set 1

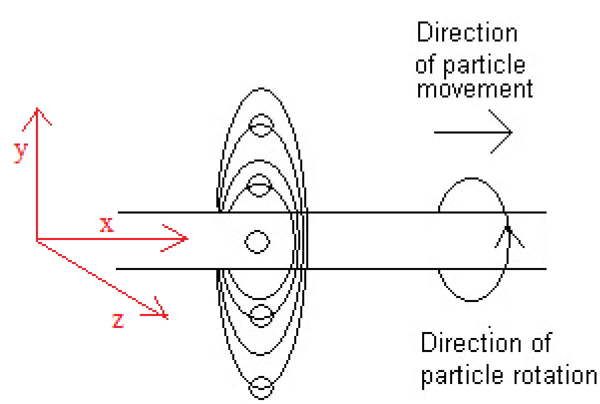

Figure 6: Here, we see a section of the wire carrying electrons from figure 4. The red x y and x axis in this figure represent the same x y and z axis from equation set 1.

Figure 6, combined with equation set 1, are proof McMahon field theory holds true. Let me explain.

Y axis:

For the y axis, as the electron in the wire approaches the speed of light, length contraction pushes the electron up in the y direction, and time dilation allows the electron to exist in the wire, as well as in the coils outside of the wire as flux at the same time. From this viewpoint, the viewpoint of the y axis, the mass of the system is seen to increase in accordance with:

Mass(from y-axis viewpoint only) = Mrestγ = $\dfrac{M_{rest}}{\sqrt{1 - \dfrac{v^2}{c^2}}}$

Where:
Mrest = rest mass (kg)
V = observed velocity (m/s)
C = the speed of light = 299792458 (m/s)
a = acceleration (m/s^2)

Since force = mass x acceleration, we can say the equation $f_y = m\gamma a_y = m_T a_y$, from equation set 1 holds true.

Z axis:

For the z axis, as the electron in the wire approaches the speed of light, length contraction pushes the electron sideways in the z direction, and time dilation allows the electron to exist in the wire, as well as in the coils outside of the wire as flux at the same time. From this viewpoint, the viewpoint of the z axis, the mass of the system is seen to increase in accordance with:

Mass(from z-axis viewpoint only) = Mrestγ = $\dfrac{M_{rest}}{\sqrt{1 - \dfrac{v^2}{c^2}}}$

Where:
Mrest = rest mass (kg)
V = observed velocity (m/s)
C = the speed of light = 299792458 (m/s)
a = acceleration (m/s^2)

Since force = mass x acceleration, we can say the equation $f_z = m\gamma a_z = m_T a_z$. from equation set 1 holds true.

X axis:

For the x axis, things are slightly more complicated. As the electron in the wire approaches the speed of light, length contraction pushes the electron sideways in the z direction, and upwards in the y direction. Time dilation allows the electron to exist in the wire, as well as in the coils outside of the wire as flux at the same time. Thus, the length contraction effect contracts the flux particle paths from the x direction into the y and z directions together. From this viewpoint, the viewpoint of the x axis, the increasing mass of the system with velocity under relativity in the x direction is being trans-located to the x and y dimensions at the same time. Thus, from this point of view, 3 dimensions are under consideration, not just 1. Thus, from this point of view, mathematically we can see why mass may be considered to increase in the x direction accordance with:

$$\text{Mrest (along x axis)} = M_{rest}\gamma^3 = M_{rest}\left[\frac{1}{\sqrt{1 - \frac{v^2}{c^2}}}\right]^3 = \frac{M_{rest}}{\left[\sqrt{1 - \frac{v^2}{c^2}}\right]^3}$$

Where:
Mrest = rest mass (kg)
V = observed velocity (m/s)
C = the speed of light = 299792458 (m/s)
a = acceleration (m/s^2)

Since force = mass x acceleration, we can say the equation $f_x = m\gamma^3 a_x = m_L a_x$, from equation set 1 holds true.

However, the mass of the whole system is what we need to consider, rather than from different axial points of view. From McMahon field theory, this is simply:

$$\text{Actual observed mass (whole system)} = \text{Mrest}\gamma = \frac{M_{rest}}{\sqrt{1 - \frac{v^2}{c^2}}}$$

References:

Einstein,A. (1905) *On the electrodynamics of moving bodies.* June 30, 1905. Annalen der Physik. **322** (10): 891–921

McMahon, C.R. (2010) *"McMahon field theory: Theoretical unification of relativity and quantum physics, thus methods to generate gravity and time."* The general science Journal.

McMahon, C.R. (2013) *"Fine structure constant solved and new relativity equations– Based on McMahon field theory".* The general science journal.

McMahon, C.R. (2015) *"Electron velocity through a conductor*". The general science journal.

Wikipedia (2014) *mass in special relativity*. Link: http://en.wikipedia.org/wiki/Mass_in_special_relativity. Link last accessed: 21st March, 2014.