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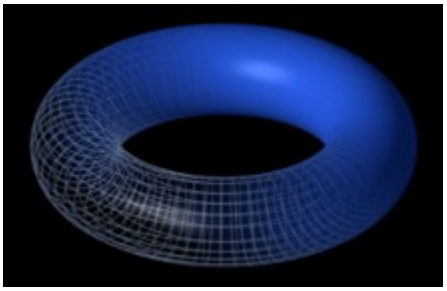
The Toroidal Topology of the Electron?



by Miles Mathis

This paper is an analysis of a 1997 paper by J. G. Williamson and M. B. van der Mark. A reader of mine just sent me a link to it yesterday (Feb 2012), and I found it worth linking to and remarking upon.

In short, the authors are offering the electron as a photon with a complex motion, so you can see why their paper interests me. I did the same thing in 2008. We will see how our theories differ.

In the first paragraph of the abstract, we find them proposing that the electron is composed of a photon "confined in periodic boundary conditions of one wavelength." So that is a major difference from the start. My electron is a photon with stacked spins, and each spin is a separable wavelength.

In the first paragraph of the introduction, we are pleased to find them admitting that the physical origin of charge and half-integral spin are "not fully understood." However, we must point out that that is a huge understatement. They aren't understood at all, since they are just terms with no mechanical or physical assignment. In QED, charge isn't even a real field, it is just math. Charge is mediated by a messenger photon which is virtual, meaning *imaginary*. Beyond that, I have destroyed the entire idea of half-integer spin in my paper on Stern-Gerlach.

In paragraph three, they admit that the Abraham-Lorentz theory of the electron calculates an infinite energy for the electron. They don't admit that that prediction is even worse than the vacuum catastrophe (which I have also solved), where the error was only 120 orders of magnitude. This is an infinite error. Then they tell us that by the same equations, the mass of the electron gives us a radius of about 10^{-15}m. Unfortunately—and they admit—we know from the scattering experiments of Ali and Soding (1988) that the electron is pointlike down to 10^{-18}m. This should interest my readers, since I have shown two errors that solve this problem. One, my simple correction to errors in the Rutherford and Bohr equations bring the electron radius down to 2.244×10^{-17}m. Two, I have shown that the fine structure constant is another margin of error, caused by this and other errors, so that the size scale estimates are off by 137. The atomic level is 137 times *larger* than we have been told. Since Ali and Soding were using current equations to estimate their sizes, they were off by 137, which means their number should be around 10^{-16}m. So you see how that problem is solved.

The authors then imply—to their credit—that the so-called Poincaré stresses are a fudge to explain internal forces on the electron that we have seen in many experiments. They also point out that these stresses contradict what we are told about the electron being pointlike. It is either pointlike or it is not. A point cannot have internal variations, whether we call those variations stresses or anything else.

At the top of p. 3, they say,

In this paper, we formulate a simple model based on a single postulate: that there exists a state of a self-confined single-wavelength photon. We will argue that these distinct states are created and destroyed in charge-conjugate pairs.

Doesn't look promising, since they are replacing the fudge of Poincaré stresses with the fudge of charge-conjugate pairs. But we will wait and see what they do with it before we criticize (see below). Then they say,

Although we have simply postulated that the photon may be confined, we will also discuss some possible origins for this confinement.

As we proceed, remember that my stacked spins explain this "confinement" in a simple way. The photon is not confined, it is simply inside its own spins. Since outside spins have a spin radius greater than the radius of the photon itself, it may look like the photon is confined. The photon is in a sort of spin bubble of its own making. But it is not really confined by its spins, any more than you are confined by your skin. Yes, it is in there and can't get out under normal conditions, but it is not confined (like the quark) since in electron "annihilation" it does get out. The outer spins are lost.

Still on p. 3, the authors now make their sweetest step, a step that causes me to forgive them (almost) everything: they actually read the electron-positron "annihilation" diagram in a logical manner. I have never seen that done before by professional physicists. In other words, they read this diagram

$$e^+e^- \leftrightarrow \gamma\gamma$$

to mean that the photons are *results* of the "annihilation," rather than entities that simply appeared out of nowhere for no reason. I recently defended Erik Andrulis, since his theory implies the same thing, but Andrulis is not a professional physicist. Williamson and van der Mark make the logical inference —which is that the photons were contained in the leptons—and they go from there.

In explaining the motion of the photon inside the electron, they revert to some very squishy theory. They try to create a geodesic "as the shortest distance between two points." But they have said that their solution here was to be "semi-classical," and there is not much classical or even semi-classical about geodesics being the shortest distance between two points. Classically, the line is the shortest distance between two points. Their geodesic is just a non-Euclidean fudge, especially because they admit the geodesic is not caused by the gravity field. They are trying to invent a tight curve with curved math in an E/M-only field, but if they are going to use mathematical tricks like that, they shouldn't have proceeded the way they have. They started out trying to be mechanical, and now they are backsliding into mathematical tricks.

On page 4 they diagram the photon as a "twisted strip." This looks a lot like Andrulis' spiraling gyre, and I have to wonder if there is some connection. In an unpublished paper analyzing Andrulis, I say this:

Andrulis seems to think he has created a wave that is like the wave we measure with light, but I don't think he has. I have shown that to create this wave, you actually need two stacked spins. His stretched spiral will create a longitudinal wave, but we need both a longitudinal wave and a transverse wave. I will be told that a spiral can create two separable waves, and that is true. But if you study the breakdown of vectors, you find that his quantum must travel on the z axis to express them both. In other words, Andrulis' gyre must travel in the direction of the spiral axis, which I have called the z axis. If it travels in either the x axis or y axis, it cannot express more than one wave. My model doesn't have this requirement. My photon can travel in any direction, since the two stacked spins are not part of a single spiral. In other words, both spins aren't part of the same motion. This is important when explaining real motions, because in this case photons don't have to turn. They don't have a necessary front and back. In collisions, we don't have to reposition them to match their new linear vector, since they can take any given vector. Another way to say this is that my stacked spins have full 3D symmetry; spirals don't. To see what I mean, it is best to study the animation provided by Chris Wheeler in my superposition paper. This motion has some similarities to spiral motion, but it is a little more complex. Those who don't understand my theories often claim that my stacked spins are fantastical and can't be created in the real world. But they don't explain how Chris Wheeler managed to animate them so easily in that case. Something that is physically impossible should be impossible to animate, no? It sounds like the same argument we have gotten for almost a century: that superposition, multiple spins, and duality are impossible to diagram or visualize. It was never true, and I have now put the claim to rest.

Evidence points to my model rather than the model of Andrulis. If the two waves were caused by a spiral, then we would find variant E/M fields, depending on our vantage. If we measured the field from the x or y axes, we would find two waves; if we measured from the z axis we would find one wave. Just look at a spiral from on end: only one wave is created, that wave being caused by the radius of the spiral. But then study my animation from the front view. That is like having the photon come directly at you. That photon still has two separable waves: one from the axial spin and one from the x spin. This means that my model is capable of full rotation, retaining field symmetry. This is what we see from data.

All this applies to the twisted strip of this toroidal geometry as well. A lot of current theories use spirals and tori, and these structures do have similarities to my stacked spins. But spirals don't work when it comes time to build equations and match them to data. The spiral simply doesn't have enough complexity or degrees of freedom to explain data. Which is why these authors get into trouble so fast in this paper. They try to force complex data from motions that are too simple. They try to make up for this by using fancy shapes and words like toroidal, but in that sense these new theories are too much like string theory. They are heavy on lingo and esoterica, and short on mechanics.

The next step is twisting this twisted strip again, to make it fit inside the electron. And, again, the diagram offered looks a lot like Andrulis' nested gyre.

Applying periodic boundary conditions of length one wavelength corresponds to bringing the ends of the strip together in such a way that there is still exactly one full twist in the resulting closed loop.

Yes, it is on page five that the mechanics starts to unwind. How do boundary conditions bring the ends of the strip together? This is never explained. Also, the twisted strip is drawn with electrical and magnetic components, with E and B vectors, but then the authors tell us "we would like to emphasize that the photon remains uncharged." This begs the central question of the entire paper: how can an uncharged particle create a particle with charge? The authors spend the rest of the paper flogging logic to make this happen, as we will see.

Remember that I explain this by a recycling of photons. A photon with enough stacked spins develops a large enough radius—and thereby angular momentum—to start pulling smaller photons in at the poles. At this point it becomes an engine to the charge field, and at this point it becomes a lepton instead of a photon. And at this point, it slows down in the field, due to its new characteristics as an engine. I have solved this problem by separating E/M into two levels of energy transport. The

fundamental level is the photons, which can stack spins but which cannot recycle other photons. The photons are the charge field, and they drive everything else. They are not engines, they are more like wind. Ions then recycle this field, and it is ions that create the E/M field. E/M is a result of charge reycling. E/M is one step up from charge. Charge is the mediator of E/M. Charge is photons, E/M is ions.

But because other theorists don't have any (or enough) mechanics at this level, they are forced to go circular, and their particles start performing actions upon themselves—as the photons in this torus theory are doing.

At the bottom of page 5, we get a major error:

In a creation process both these sorts must be present in pairs to ensure the conservation of charge, four-momentum and angular momentum.

That is what they meant by charge conjugation way above. But this is false. We have no evidence of conservation of charge, except globally. Locally, there is no physical reason photons cannot outnumber anti-photons or electrons cannot outnumber positrons. In fact, we have lots of evidence of non-conservation. I have shown that is what causes the lack of field symmetry in beta-decay. The process creates a photon but not also an anti-photon, and the surrounding field is skewed. Photons do not have to be created in pairs. If they did, we wouldn't see a preponderance of matter over anti-matter locally (on Earth). Yes, photons can be created in pairs for various real reasons, but they don't have to be.

Still bottom of p. 5:

The circulation repeats itself with a period of half a wavelength. In flat space, this would lead to total destructive interference everywhere along the path. Within our object, where we have demanded that space is curved, the interference is always constructive as is clear from Fig. 1b.

That is inside the electron. But again, they have "demanded" that space is curved, but not shown it. What mechanics of the E/M field curves space that much in such a small area? We get nothing. Notice that the theory utterly falls apart without that quick curvature, because without it 1) the ends of the twisted band won't meet, and 2) the interference would be destructive.

The problems continue in part 3, CHARGE. Although we were told explicitly (above) that the photon remains neutral, the authors now claim, "In our case, since we have an electromagnetic field present in this topology, this may also give rise to a real electric charge." They just went circular. How is there an electromagnetic field present? Do they mean just because they labeled their twisted strip with E and B vectors? I already pointed out that cheat. Photons don't have E and B vectors. According to current theory, they have undefined qualities that *may* produce E and B vectors in the field, given ions; but photons themselves do not have such vectors. That is why they are uncharged themselves. The authors are trying to have it both ways. Or do they mean that the electromagnetic field is present from data. The electron has a field. But that is clearly circular. They are taking the field as a given while trying to explain its genesis. Either way, the math in this section is all circular.

Section 4 SPIN is no better,

In this section we will show that, at least for one special direction (the z-axis in Fig. 2), the spin in our model is ±½ h as a result of the non-Euclidean topology of our model.

Again, the curved math cheat. Curvature without having to explain where it comes from. All the math in this section is therefore unsupported.

I will skip ahead to section 6 POINTLIKE INTERACTION and the HARMONY of PHASES. After starting out with some signs of freshness, the paper continues to unwind in a very ugly manner. The authors tell us that their model is purely electromagnetic rather than material, and that this gives them "interesting consequences" when viewed from relative motion. To start with, they haven't shown that their model is electromagnetic, since the electromagnetic quality was manufactured, as I have shown. All they have is unsupported and circular math, so the E/M nature has not been proven or even indicated. "Photonic" and "electromagnetic" are not synonyms and have no physical equivalence. Furthermore, they have not shown that their model is *not* material. Very much the reverse. Simply by proposing photons rather than field waves, they have created a material model. By talking of confinement, they have implied materiality, since if you have no material, you have nothing to confine. Something is implied to be moving in the diagrams, and that something is implied to be material. So the last quote is very strange, in context.

But they need to deny materiality, because they are about to incorporate a further mathematical fudge, this time in the form of a misuse of Relativity. I won't unwind all the Relativity math, I will just point to the central push. Normally mainstream physicists use the tweaked time transform that is currently buried in the tensor calculus, in the form $t = \gamma t_0$. Instead, these guys use the equation

$t_0 = \gamma(t - vx/c^2)$

That is really extraordinary, and I spotted it immediately. I spotted it because no one ever uses that equation anymore. Yes, it comes straight from Einstein, but it is upside down to the current transform, as you see. This equation is used only when a physicist needs to push an equation, as they are doing here. Actually both time transforms are pushes, since neither is correct, but it is amazing that both equations exist and are used freely. It would be like using the equations $v = x/t$ *and* $v = xt$. Just think of all the things you could prove if you had both to use.

Why are they going to all this trouble, bringing in time transforms and pushing them all over the place? To show why their electron, which should have a radius of 10^{-12}m according to their equations, is pointlike down to 10^{-18}m. Since I just told you why that is, we know all this is a push. Which means it is quite embarrassing to have to look it. But it does highlight the fact that they found that huge number for the electron radius, which is bigger than the Bohr radius. The authors didn't shy away from the ridiculous number, because current theory makes the same mistake, and doesn't even bother to hide it. I suppose we should give these authors some credit, in that at least they recognize how absurd that number is, and try to fix it with a cartload of fake transforms. I fix by more direct methods—by correcting the Rutherford equation and showing what the fine structure constant is hiding.

I have gotten a lot of emails over the years pointing me to various toroidal models, most of which I have just scanned and left, without comment. After finally taking the time to pull one apart, I can see that they all must be related, though in ways unknown to me. Was this paper of Williamson and van der Mark the prototype? Did Andrulis study this paper? Do the other torus models come from here, or is there an earlier model? I don't know and don't really care. This paper was a bit more rational in the early stages than the others I have looked at, but it quickly unravelled. The authors were on the right track when they forced themselves to be mechanical or what they call semi-classical. They went off track at the very moment they started substituting their pushed math for rigorous mechanics.