A new theory of Plasma Tube fields and the operation of the "Rife effect"

I have been working for some time on a new theory to describe what kind of radiation is being emitted by plasma tube machines and how this may relate specifically to the observed bioactive effects.

Given the recent interest in E fields, harmonics and the like I thought it was time I released some more details for the benefit of researchers.

A couple of months ago Jim Bare mentioned the crossed field antenna (CFA) in a post to the Rife list. I looked this up and did some more research into it and came up with some interesting new ideas.

Basically, the CFA is a supposedly new and revolutionary radio antenna that works by directly synthesising electromagnetic radiation (a Poynting vector) by using crossed electric (E) and magnetic (H) fields. In fact, the CFA is nowhere near as original as it might seem, such things have been proposed before, and in one sense all aerials work this way.

The Poynting vector describes an electromagnetic wave in theory. A vector E field is crossed orthogonally with a vector H field and the result in theory at least is a Poynting vector (an EM wave). In a normal aerial this phenomenon occurs in what is known as the "far field" i.e. usually a long way away from the aerial. The "near field" consists of crossing E and H vectors that do not produce EM waves.

The reason why some crossed E/H vectors create EM waves and not others depends on several factors.

1. The E and H fields must cross orthogonally (at 90 degrees).

2. The ratio of the E field to the H field is set by the impedance of the medium in which the wave (Poynting vector) is synthesised - if the ratio does not match the impedance of the medium then it will not form a proper Poynting vector in that medium. For free space the impedance of the medium is 377 ohms, so this means that the E/H field ratio MUST be 377 if it is to create an EM wave in free space (i.e. air etc).

3. The two vectors must be in phase.

4. The Poynting vector must be positive (i.e. an "outward" vector) to radiate. A negative Poynting vector (an "inward" vector) will not radiate EM waves but will transfer power into the medium.

So for a normal radio aerial all these conditions are met somewhere in the "far field" and it radiates EM waves - i.e. radio waves.

In the case of the CFA, the idea is to optimise an aerial design to specifically meet these mathematical conditions and in that way to obtain a much higher efficiency than normal. So you need to create an E field and a magnetic field. The CFA is controversial because it proposes manufacturing the H field by relying on a displacement current to create a magnetic field. The controversy is partially because the existence of displacement current is controversial.

To diverge for a moment we need to look at what displacement current is.

James Clerk Maxwell wrote his famous equations of Electromagnetic Energy back in the mid 19th century. Maxwell was a real genius and a very capable mathematician. He took a new vector type theory that was developed by one of his tutors (William Hamilton) called quaternion theory and applied it to electric and magnetic fields. In doing that Maxwell ended up with a set of 20 quaternion equations that describe all Electromagnetic interactions.

The problem was that few people other than Maxwell understood quaternions! So various people set out to condense and simplify Maxwell's equations into standard vector form. The principal contributor to this was Oliver Heaviside. Heaviside reduced all of Maxwell's work to 4 simple vector equations. This was very well received and became the cornerstone of modern EM theory. But it's worth remembering that the 4 vector equations we see today and call "Maxwell's equations" are not really the Maxwell equations but Heaviside's equations.

But .... Heaviside made mistakes! His work has been extensively analysed by modern mathematicians and it's clear that not only did he make mathematical errors in his transcription, but he also over simplified - and some of Maxwell's original, brilliant work was lost in the translation.

So most modern EM theory is actually founded on work that is basically incomplete. Some scientists believe that Maxwell was closer to the "Holy Grail" of physics, a unified field theory, than Einstein ever was.

Anyway, one item that was transcribed correctly by Heaviside was the idea of a "displacement current". Engineers know that a capacitor cannot conduct DC current. However, if you connect a capacitor to a source of DC, a current does flow - one that charges up the capacitor. This current is the displacement current. A capacitor will let AC currents flow, but how the current gets across what is basically an insulator (the dielectric of the capacitor) is also controversial - this is also displacement current according to Maxwell. The reason Maxwell calls it "displacement current" is because he envisions it as an energy field that is caused by displacement of ions in the dielectric. This has often been wrongly interpreted to mean that he was proposing direct conduction through insulators - he wasn't.

Many people have also wrongly interpreted Maxwell's displacement current as being something purely imaginary, a mathematical fudge to make the equations work out - usually because they've studied the theory second hand (a la Heaviside) and haven't read what Maxwell himself has to say about it.

And so, even today, many professors of EM theory will still teach that the displacement current is purely imaginary, that it doesn't really exist and that it's a mathematical trick. The fact is, the displacement current does exist - one way it can be detected is as a magnetic vector field that appears inside capacitors.

This explains part of the controversy over the CFA. Some older "experts" in EM theory insist that because the displacement current doesn't exist, a magnetic field created by displacement current can’t exist - and so if there is no H field produced by displacement current, the CFA can’t work at all.

The inventors of the CFA insist that they have measured the displacement current and its magnetic field and proved that it exists. In fact many major universities are now teaching the same thing, so it’s not as “out there” as it may seem.

What hasn’t helped the controversy is that many people have tried to build CFA antennas with very mixed results. Some people swear it works brilliantly, others that it doesn’t work at all. Most have intermittent and inconsistent results. The inventors of the CFA want to keep actual constructional details a trade secret, which doesn’t help.

What struck me after reading hundreds of accounts by CFA experimenters was the similarity between their reports and those of Rife researchers.   This makes perfect sense if in fact the Rife effect is a manifestation of the same principles claimed for the CFA.

Anyway, back to Rifing.

It suddenly occurred to me that the plasma tube used by Rife type machines is in fact a form of CFA!   Taking a phanotron tube for example, one can see that you have two electrodes separated by a partially conducting medium (the gas plasma). The electrodes tend to have a high voltage across them (they need to, to ionise the gas). In many ways this is similar to a capacitor, and in fact Rife type plasma tubes tend to be primarily capacitive. Now according to Maxwell, if you have a high AC electric field across the electrodes then there is a displacement current - and that displacement current manifests as a magnetic vector field which circles around the axis of the tube. Not only that, but you have a second magnetic field in exactly the same place which is caused by the motion of ions through the gas plasma. So in effect you have two magnetic fields reinforcing each other.

These two fields extend outside the tube - and cross in the space near to the tube - exactly what is needed for electromagnetic radiation. And of course we know that’s true because a phanotron excited with RF energy does transmit some RF. But inefficiently - a plasma tube is not a very good radio aerial. The question then becomes, why not?

The answer is surprisingly simple. The magnetic field created by a plasma tube is much stronger than the magnetic field of a normal aerial (i.e. a dipole). And also the area in which vectors from the tube cross is very close to the tube (there is no real “far field”). So if you have a stronger than normal magnetic field crossing with an E field, over the span of the field in general you get a much lower than normal E/H ratio - and in the case of a normal radio aerial that ratio needs to be 377 (the impedance of free space) in order to transmit. So of course the plasma tube doesn’t transmit very well because this ratio condition is only found in a few rarefied parts of the total field.

The next question is how this relates to Rifing.

Well, so far we’ve been talking about free space - air is considered to be free space to all practical intents and purposes in normal radio transmission. So what if we propose that we can synthesise Poynting vectors NOT in free space but in some other medium? In that case the E/H ratio would be different and in theory we'd get a optimal power transfer into some medium other than free space.

Now if you take some average published figures for permittivities and permeabilities of body tissue, it turns out that the calculated average impedance of body tissue is pretty much that of water - which just happens to be around 133 ohms.

So if the theory is correct, what this could mean is that if we interject a human body (or even a tank of water) into the vector fields emitted by a plasma tube, we might just find that EM radiation is being synthesised DIRECTLY INSIDE the water or the tissue because of the abnormal E/H ratio.

Let's get this clear. We're not talking about some EM radiation emitted by the tube which impacts on some tissue - we're talking about the EM radiation itself being built up from its component parts directly inside the tissue itself.

And in this way, what this means is that we would not see any EM radiation actually emitted by the tube, but we would see EM radiation appearing almost magically inside cells!

Now some people are obviously thinking, lets get a tri-field meter and measure this. The answer is, you can't! The reason why is that the synthesis only occurs inside the medium in question. Unless the sensors of the tri-field meter just happen to be made of the same material as the medium in question (in this case body tissue) then it will give a false reading. The only way you'd get a good measurement of this kind of field would be to immerse a tri-field meter in water (in such a way that the water gets inside the sensors). And if the sensors use other material such as ferrite for example, then you will only measure the impedance field of ferrite, not body tissue (or even free space for that matter).

There is a secondary way that may work, but is not guaranteed for reasons I'll explain in a moment. If the theory is correct, then any outward Poynting vectors formed directly in tissue or water may cause secondary EM re-radiation into free space. So one way to measure the effect is to measure the field in the absence of a human body and then again when a body is placed into the field. If there is a sudden increase of EM emission when the body is introduced into the field then it indicates vector synthesis is occurring inside the tissue and being re-radiated into normal space.

However, this will only work if the Poynting vector formed happens to be an "outward" or radiative vector. If the actual vector formed in the tissue just happens to be an "inward" or non-radiative vector then you would still see power transfer into the cell or tissue but no corresponding re-radiation to measure. I personally believe that the inward vectors are the ones that produce the "Rife effect".

Anway, if we let the implications of all this sink in, what it means is that the Rife effect from plasma tubes may in fact be due to direct induction of photonic discharges inside cells themselves. In layman's terms we would expect to see microscopic flashes of radio energy or even light actually being induced directly into the cells.

Lets diverge again for a moment to look at the fields themselves.

What we’re talking about here is two vector fields, one electric and one magnetic. A vector is basically a one-dimensional object, it has length but no width or depth. As such it’s impossible to measure a vector directly. How do you measure something that has no width?

The only way we can measure vectors is by looking at what happens when vectors impact with some normal object (which has width and depth etc.,) and see the effect.

So if we go hunting around the plasma tube looking for direct manifestations of vectors we’re not going to see anything! In fact, the whole thing will appear to be some sort of magical or subtle energy - we know the energy is there because it affects things but we can’t see it directly! Sound familiar? :-)

Now if we look at things like penetration and shielding we get further apparent confusion. We know that the Rife effect is often reported to work right through a normal Faraday cage (which blocks all normal EM radiation). We also know from Rife’s own statements that the effect seems to penetrate lead, but is apparently blocked by aluminium.

This starts to make sense when we consider that until the vector is formed inside the tissue of the subject, we’re actually looking at separate E and H vectors. So what we should be considering is whether any given material can block separate E and H fields.

Take lead. Lead is great for blocking ionising radiation, but to a magnetic field it’s almost totally transparent! An H field will penetrate lead easily. In fact an H field will penetrate almost all materials except ferromagnetic materials like Manganese, Iron, Cobalt and maybe Nickel.   Now lead is often used as a conductor but it’s actually a very poor conductor - one of the worst of the normal metals, this is because its electrons are bogged down and sluggish inside its heavy matrix. So in fact, it won’t really block an E field either, because to do so it would need to quickly conduct away the potential of the field. So lead will not form an appreciable barrier to either the E field or the H field - and so we would expect the Rife effect to penetrate lead quite easily - exactly what is observed in practice.

Now take aluminium. Aluminium will not block an H field. But aluminium, together with tin and zinc is a very “crystalline” sort of metal. It’s also a good conductor. The effect of it’s crystal matrix means it will significantly distort an E field - perhaps throwing it out of phase. It’s conductivity will also conduct away the potential of the E field. And so we would expect aluminium to be a good blocker of the Rife effect - again, exactly what is observed in practice.

So to summarise, we would expect Aluminium, Zinc, Tin, Manganese, Cobalt, Iron, and possibly Nickel to be good blockers of the Rife effect, whereas lead would not be.

No other theory to my knowledge to date has been able to explain this.

A Faraday cage which basically consists of any conducting material will not block the vectors unless it just happens to be made of one of the blocking materials.

Now, earlier I proposed that the vector fields may induce photons into tissue, including photons of light. This may seem to be a strange conclusion - how could we get light from radio waves?

The answer lies in the Poynting vector synthesis. Remember that one of the conditions that leads to synthesis of a vector is that the E and H vectors must be in phase. So what happens if they're not?

Well it's possible that if you have two vector fields that basically consist of waves of electric and magnetic energy that are out of phase - then there is a possibility that their waves will cross only in some places. So there is a possible situation in which only PART of a magnetic vector crosses with only PART of an electric vector momentarily in the right intensity ratio.

When this happens we will get a normal Poynting vector - however not a complete wave but just an extremely narrow spike. A spike of electrical energy is translated by the Fourier series into harmonics - so we'd see an extremely high frequency pulse of EM radiation together with extremely high frequency harmonics. There is absolutely no reason why this spike could not be of picosecond or femtosecond duration - and so we'd expect to see a direct synthesis of a frequency and it's harmonics right up the terahertz frequency band. And it just so happens that this range corresponds to visible light!

And so it's perfectly logical to suppose that one of the effects of the tube might be to directly induce pulses of light directly into the tissue itself. We wouldn't actually see any light because we're talking about individual photons here, it would be so low intensity it would be way below visibility, but it might be enough to affect a cell or cause photochemical reactions inside a cell.

One possible way to test this would be to set up a tank of water in a darkened room with a really sensitive quantum photomultiplier that could detect individual photons, and then put the tank inside the fields from a plasma tube (with some sort of light shielding of course).

This theory is so far-reaching and comprehensive that I could describe all kinds of additional exciting effects but I'll confine myself to one last one that may be relevant to Rife work.

All molecules interact chemically because of their respective energy levels. These are commonly called molecular orbitals. These energy levels are described by a type of equation called a Schrodinger equation (yes, the one of the famous cat!). Now the Schrodinger equation itself is very complex - in fact it can't be solved directly for anything more complex than Hydrogen but it can be played with mathematically.

Now one way of looking at a Schrodinger equation is that it describes energy. So does a Poynting vector. And as far as I know it is possible to represent any Schrodinger function as a combination of Poynting vectors.

But we're proposing the direct synthesis of Poynting vectors - so doesn't it make sense then, that if we can synthesise a Poynting vector we may be able to either synthesise or at least affect a Schrodinger function?

If we look at this in purely mathematical terms, applying a Poynting vector to a Schrodinger function results in something that is called a second order tensor.

And here is the interesting bit, a second order tensor has a physical interpretation - it represents the distortion or stressing of a molecule!

So if a Schrodinger function tells us the energy level of a molecule it also tells us about its structure. If we apply a second order tensor we end up stressing or distorting that molecule. And in that way we directly change the energy matrix of the molecule and change it's chemical properties.

And if that molecule in question just happens to be a protein or a strand of DNA...?. You get the picture. This provides a possible explanation for the bioactive effect. It could be that the principal bioactive effect of a Rife machine is to stress or deform specific complex molecules inside the cell, particularly DNA and proteins.

If look at bacterial cells walls, they tend to be made of a complex network of interlinked proteins called Peptidoglycans - they are held together by relatively weak molecular interactions. So if we can stress the structure of a Peptidoglycan protein chain, then we can predict it will result in the collapse and destruction of the cell wall itself. As soon as that happens the natural osmotic pressure inside the cell will cause the cell to explode.

And so in this purely hypothetical way, starting from quantum mechanics we end up at a possible and credible explanation for one of the Rife ray effects on living cells.

There are various other relevant conclusions that can be drawn from this theory but I won't go into them in detail here. One of the main ones is that we can predict that certain parts of the field from a plasma tube will be stronger than others and that the field geometry will be directly related to the electrode geometry.

A second, more interesting implication is that frequencies by themselves may not directly be responsible for the MOR effect - it might be that specific frequencies and waveforms just happen to be optimal for maximum power transfer into different types of tissues, or for creating photonic pulses due to phase relationships. It may well be true that different frequencies have identical effects on the same structures, and that there is in fact no need to use specific frequencies for specific diseases. However this will need further research.

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