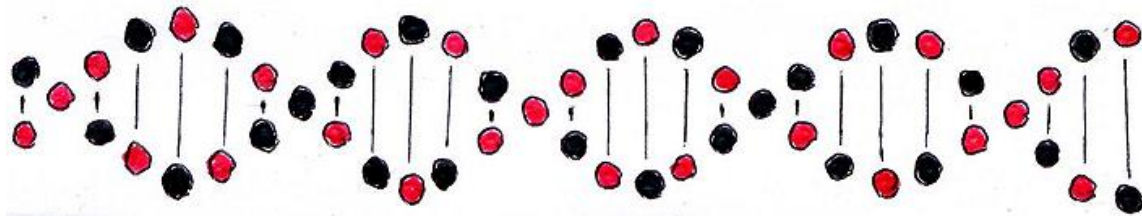


Electromagnetic Radiation in the Near Magnetic Field

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Abstract. This article follows on from the double helix theory of the magnetic field [1]. A closer look will be taken at the relationship between electromagnetic radiation on the one hand and a steady state magnetic field on the other.



Introduction

I. Consider a marble rolling frictionlessly along a horizontal sinusoidal surface. It rolls up the hills and down the dales. It can do this so long as it has enough energy to get to the tops of the hills. In this context, the product of force times velocity, $\mathbf{F} \cdot \mathbf{v}$, is a measure of the rate of flow of energy, where gravity is the force. This product will be negative every half-cycle as the marble rolls up the hill, but this does not alter the fact that the energy is always flowing in the same direction. And so it is with the Poynting vector, $\mathbf{E} \times \mathbf{H}$, in the case of sinusoidal wireless EM waves. The direction of the Poynting vector changes every half-cycle, but the electromagnetic energy continues to flow in the same direction.

If, however the marble didn't have enough initial energy, it wouldn't get over the first hill. This is analogous to the case of the near magnetic field in a DC electric circuit. When the steady state is reached, it is analogous to the marble being brought to rest by its own weight some way before the top of the hill. In a steady state DC circuit, an equilibrium has been reached between the electric field from the power source, on the one hand, and the combined effect of the electric resistance and the inductive impedance on the other hand. The impedance is in effect the weight of the induced magnetic field pushing back on the electric current.

The Double Helix Theory of the Magnetic Field

II. The double helix theory of the magnetic field, [1], considers that space is a dielectric filled with tiny dipolar vortices that act like miniature electric circuits [2], [3], [4], [5]. These tiny electron-positron vortices are aligned, electron to positron, in a double helix fashion along their mutual rotation axes, hence tracing out the local magnetic lines of force. The electric fluid of the vortices is otherwise known as *the aether*, and each vortex would comprise of an aether sink (electron) in orbit with an aether source (positron). This would enable a miniature electric circuit and magnetic field to be present everywhere in space.

The time varying electromagnetic induction process would take the form of an overflow of pressurized aether from one vortex to its neighbour, in conjunction with angular acceleration [5]. Although electric current involves the motion of charged particles, it is proposed that this motion is tied up with a deeper under-current of primary aether flow. Positive particles will be accelerated by the increasing pressure that occurs when the power is first connected, while negative particles will eat their way in the opposite direction towards the source.

According to Maxwell in Part I of his 1861 paper, where he explains Ampère's Circuital law around about equation (9), the tiny vortices that already exist in space will re-orientate with their rotation axes tracing out solenoidal rings around a source electric current. The creation of this near magnetic field is like the creation of smoke rings, and as well as being an alignment of tiny aethereal vortices, a magnetic field is also a kind of storage tank of fine-grained circulating aether pressure. As a magnetic field is being generated, pressurized aether flows tangentially from the conducting wire into the field.

The Near Magnetic Field

III. In a DC circuit, when the power is switched on, Ampère's Circuital law kicks in. The tiny electron-positron vortices that fill all of space, begin to align around the current. Pressurized aether flows tangentially from the wire into the vortices as in the same process that is involved in wireless EM radiation. But because we are dealing with DC, the radiation stops when the steady state is reached. When the magnetic alignment is complete, as when all the vortices are aligned with their mutual rotation axes forming solenoidal concentric circles around the source electric current, they will be spinning such that the aether flow within them is in the opposite direction, at the point of contact, to that of the aether that is flowing in the wire. This will prevent any further aether from passing from the wire into the magnetic field, since flowing aether cannot pass laterally through itself. As the current continues to rise, the vortices will be

induced by a combination of centrifugal force and conservation of angular momentum to spin faster, and the magnetic field will increase in intensity, but all the energy will be trapped in the field. There will be no far field radiation.

It should be noted that the electrostatic aether pressure in a conducting wire acts perpendicularly (radially) and adds to the precessional effect in the surrounding vortices. While this will be a rapidly diminishing effect as we move away from the wire, it is nevertheless of importance in cable telegraphy [6].

Far Field Radiation

IV. The mechanism for wireless electromagnetic radiation was explained in *“Wireless Radiation Beyond the Near Magnetic Field”* [7]. It was demonstrated how the electromagnetic quantities such as \mathbf{A} , \mathbf{E}_K and \mathbf{H} relate to the individual electron-positron vortices that pervade all of space, and that the EM radiation propagation mechanism is independent of what angle a ray passes through the prevailing background magnetic field lines, which are themselves simply an alignment, along their mutual rotation axes, of these same electron-positron vortices. The emission process hinges on the fact that the angular momentum of the vortices reverses repeatedly, and that as such, only an AC circuit can be used in the production of wireless waves. The precession of the vortices is crucial as regards allowing pressurized aether to escape from the conducting wire and on out into space. As explained in Section **III** above, unless the vortices precess, centrifugal pressure in the magnetic field will block further transfer of the aether from the wire into the field. Faraday’s law can apply in connection with the electric current induced in a secondary circuit during the transient stage of a DC current, but no far field radiation can occur unless the source current is AC.

The Rotating Bar Magnet

V. In theory, time varying EM induction should occur in connection with a rotating bar magnet. This proposition is deduced on the basis that the rotating magnetic field will require an ongoing realignment of the constituent vortices. This of course only happens when the magnet rotates on an axis other than its magnetic axis. During the rotation, there will be a propagation of fine-grained precession through the magnetic field which will open up a channel for the flow of pressurized aether. We are therefore dealing with far field radiation that will propagate beyond the near magnetic field. The initial torque is generated in the bar magnet, and as expected in line with the conservation of energy, an equal and opposite torque will cause the bar magnet itself to decelerate in the process.

In the case of a forced rotation involving work done, a steady flow of pressurized aether is generated within the rotating magnet. There is only one place that this aether could originate, and that is in the positrons of the all-pervading background electron-positron sea. The forced rotation of the magnet will amount to screwing aether out of the electron-positron sea. So, although energy can be screwed out of the background electron-positron sea, work must nevertheless be done to operate the pump.

Photon Theory

VI. In certain contexts, the relationship between frequency and energy in electromagnetic radiation is established by the Planck law, $E = hf$, where E is energy, f is frequency, and h is Planck's constant. Care must however be taken, because this law is likely to have its origins within the electron orbital configurations of the atoms and molecules involved in the emission and absorption process. The idea that a frequency would be associated with a discrete energy contradicts classical wave theory unless the discrete energy packages have a direct association with a particular emission source. Otherwise, the only way that we could link energy to frequency would be if we were talking about energy density, as in pressure.

The Planck relationship is usually associated with what is believed to be the particle nature of radiation. A photon of light however, although possessing momentum and being emitted as a discrete quantized pulse, is not the same as a particle. A particle is a tangible and enduring sink or source that is surrounded by a force field and which can be accelerated to arbitrary speeds. The light or gamma photon on the other hand has a fixed speed and no stationary existence, and unlike in the case of ordinary particles, two photons can pass right through each other. A photon is likely to be a discrete pulse of EM radiation associated with a particular energy transition within an atom or a molecule, or in the case of a gamma photon, it can be associated with electron-positron pair production and annihilation [8]. Photon theory is therefore just a packaging theory which bears no relationship to the deeper underlying wave theory of electromagnetic radiation. An analogy would be a shipping container in which the transportation system bears no relationship to the contents of the container itself.

Magnets in Motion

VII. When a magnet moves, its magnetic field moves with it. There is a difference however, according to whether the magnet moves translationally or whether it rotates. In the case of translational motion, any electromagnetic

induction that occurs with respect to a test charge will involve the convective force $\mathbf{F} = q\mathbf{v}\times\mathbf{B}$, hence suggesting that the electron-positron sea is entrained within the magnetic field during translational motion. For example, it makes no difference whether we move a bar magnet into a coil or whether we move the coil over the bar magnet. The result is the same. The velocity, \mathbf{v} , is measured relative to the electron-positron sea in both cases.

A DC transmission line pulse is a closed electric circulation moving like a caterpillar track between two conducting wires at a speed believed to be equal to the speed of light [6]. The surrounding near magnetic field is in a state of translational motion and so this electric pulse is akin to a bar magnet trolling the transmission line like a trolleybus.

As a mechanical body follows its straight-line inertial path, it will similarly induce the background dipolar vortices to angularly accelerate as it shears past them, while inducing a centrifugal force field akin to a weak magnetic field [9].

Conclusion

VIII. It is often wrongly assumed that electromagnetic induction only occurs when the secondary circuit is placed within the region of the near magnetic field of a primary circuit. But we know from the example of the toroidal transformer that this is not necessarily the case. Apart from the fact that a near magnetic field can mark out a zone for better flux linkage, its existence or lack of existence has no relevance to the underlying principles of electromagnetic induction that is involved. A steady state near magnetic field is in fact just a storage tank of fine-grained rotational kinetic energy that has been filled up from a DC circuit.

The near magnetic field in a DC circuit can play no part in EM radiation for the especially important reason that the aether in the vortices, at the point where they contact the source electric current, will be flowing in the opposite direction to the electric current itself. This will seal off any further transfer of pressurized aether from the wire into the magnetic field once the magnetic field alignment has fully formed, since aether cannot pass laterally through itself.

The magnetic field is acting like a flywheel, and when the source power is switched off, the stored rotational kinetic energy drives a final forward-surge of current back into the wire again.

It is said that in 1888, Heinrich Hertz proved Maxwell's theory of electromagnetic radiation when he transmitted a signal from an AC circuit, through space to another circuit. Had the receiving circuit been placed within the region of the primary circuit's near magnetic field, this would have been considered as a simple case of Faraday's law of electromagnetic induction in operation. But because the receiving circuit was too far away to be inside the near field of the transmitting circuit, this was considered as proof of Maxwell's

theory. Since this far field radiation has no directly measurable magnetic fields, sceptics sometimes ask how we know that magnetic fields are involved. We must assume however that the \mathbf{E}_K , \mathbf{A} , and \mathbf{H} vectors that are involved in radio waves or starlight in distant space, lie in the domain of the individual tiny electron-positron vortices that pervade all of space. Maxwell's theory was a theoretical prediction, and Hertz's emission circuit, by virtue of the fact that it operated on the same principles as the primary circuit of an AC transformer, albeit with specific parameters, would reasonably be considered to be an experimental proof of Maxwell's theory, bearing in mind that Faraday's law was central to Maxwell's derivation of the electromagnetic wave equation.

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<http://gsjournal.net/Science-Journals/Research%20Papers-Mechanics%20/%20Electrodynamics/Download/7057>

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"All space, according to the younger Bernoulli, is permeated by a fluid aether, containing an immense number of excessively small whirlpools. The elasticity which the aether appears to possess, and in virtue of which it is able to transmit vibrations, is really due to the presence of these whirlpools; for, owing to centrifugal force, each whirlpool is continually striving to dilate, and so presses against the neighbouring whirlpools. It will be seen that Bernoulli is a thorough Cartesian in spirit; not only does he reject action at a distance, but he insists that even the elasticity of his aether shall be explicable in terms of matter and motion. This aggregate of small vortices, or "fine-grained turbulent motion," as it came to be called a century and a half later, is interspersed with solid corpuscles, whose dimensions are small compared with their distances apart. These are pushed about by the whirlpools whenever the aether is disturbed, but never travel far from their original positions. A source of light communicates to its surroundings a disturbance which condenses the nearest whirlpools; these by their condensation displace the contiguous corpuscles from their equilibrium position; and these in turn produce condensations in the whirlpools next beyond them, so that vibrations are propagated in every direction from the luminous point. It is curious that Bernoulli speaks of these vibrations as longitudinal, and actually contrasts them with those of a stretched cord, which, "when it is slightly displaced from its rectilinear form, and then let go, performs transverse vibrations in a direction at right angles to the direction of the cord." When it is remembered that the objection to longitudinal vibrations, on the score of polarization, had already been clearly stated by Newton, and that Bernoulli's aether closely resembles that which Maxwell invented in*

*1861-2 for the express purpose of securing transversality of vibration, one feels that perhaps no man ever so narrowly missed a great discovery. Bernoulli explained refraction by combining these ideas with those of his father. Within the pores of ponderable bodies the whirlpools are compressed, so the centrifugal force must vary in intensity from one medium to another. Thus a corpuscle situated in the interface between two media is acted on by a greater elastic force from one medium than from the other; and by applying the triangle of forces to find the conditions of its equilibrium, the law of Snell and Descartes may be obtained. * Cf. Lord Kelvin's vortex-sponge aether, described later in this work."*

[4] O'Neill, John J., "**PRODIGAL GENIUS, Biography of Nikola Tesla**", Long Island, New York, 15th July 1944, quoting Tesla from his 1907 paper "**Man's Greatest Achievement**" which was published in 1930 in the Milwaukee Sentinel,

"Long ago he (mankind) recognized that all perceptible matter comes from a primary substance, of a tenuity beyond conception and filling all space - the Akasha or luminiferous ether - which is acted upon by the life-giving Prana or creative force, calling into existence, in never ending cycles, all things and phenomena. The primary substance, thrown into infinitesimal whirls of prodigious velocity, becomes gross matter; the force subsiding, the motion ceases and matter disappears, reverting to the primary substance".

<http://www.rastko.rs/istorija/tesla/oniell-tesla.html>

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[5] Lodge, Sir Oliver, "**Ether (in physics)**", Encyclopaedia Britannica, Fourteenth Edition, Volume 8, Pages 751-755, (1937)

This quote is in relation to the speed of light,

"The most probable surmise or guess at present is that the ether is a perfectly incompressible continuous fluid, in a state of fine-grained vortex motion, circulating with that same enormous speed. For it has been partly, though as yet incompletely, shown that such a vortex fluid would transmit waves of the same general nature as light waves— i.e., periodic disturbances across the line of propagation—and would transmit them at a rate of the same order of magnitude as the vortex or circulation speed" (Sir Oliver Lodge, 1937)

The article then goes on to cite Lord Kelvin, "**The Vortex Theory of Ether**," *Phil. Mag.* (1887) and *Math. and Phys. Papers*, vol. iv. and passim; also G. F. FitzGerald, *Proc. Roy. Dub. Soc.* (1899), or *Collected Papers*, pp. 154, 238, 472.

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