the general science journal

The Speed of Light varies with Magnetic Flux Density

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4th November 2007, Philippine Islands

Abstract. Archimedes' principle can be applied in the electric sea to explain paramagnetic attraction and diamagnetic repulsion [1]. **This is based on a hydrodynamical force derived by James Clerk-Maxwell and based on the concept of a sea of tiny molecular vortices. The force in question derives from a magnetic field intensity gradient in the steady state.**

It will now be shown that such a gradient in the steady state can only be compatible with the double helix theory of the magnetic field if the variable quantity is the magnetic permeability which has traditionally been assumed to be constant for a given medium. It therefore follows that the speed of light will vary with the magnetic flux density of a steady state magnetic field.

A further connection between the vorticity of a magnetic field and the speed of light extends this idea generally to the fact that the speed of light will vary with magnetic flux density.

Magnetic Permeability and Flux Density

I. In Maxwell's 1861 paper 'On Physical Lines of force',

http://vacuum-physics.com/Maxwell/maxwell_oplf.pdf

Maxwell derived a force at equation (5) of part I. He derived this force by applying hydrodynamics to a sea of tiny aethereal vortices. In this paper, we are interested in the second term on the right hand side of equation (5) which takes the form,

$$F_{x}/_{volume} = (1/8\pi)\mu d/dx(\alpha^2 + \beta^2 + \gamma^2) \qquad \textbf{(1)}$$

where $F_{x}/_{volume}$ is the force per unit volume in the x direction. The magnetic permeability μ is related to the density of the vortex sea, and the quantities α^2, β^2, and γ^2 are related to the components of the circumferential velocities of the vortices resolved in the x, y, and z directions respectively. Since the circumferential velocity of the vortices determines the vorticity, the terms α, β, and γ would normally be written in modern format by the magnetic field vector **H**.

The magnetic field vector **H** is related to the magnetic flux density vector **B** by the equation,

$$\mathbf{B} = \mu\mathbf{H} \qquad \textbf{(2)}$$

Maxwell considered the magnetic permeability μ to be a constant for a given material and this is reflected in the fact that μ remains outside the brackets of the differential operator in equation **(1)** above. Maxwell considered the spatial gradient of the magnetic field intensity in the steady state to be exclusively determined by a variation in the vorticity of the molecular vortices within the magnetic lines of force. To this day, it is assumed that the magnetic permeability μ is a constant for a given material.

The Double Helix Theory of the Magnetic Field

II. In ‘The Double Helix Theory of the Magnetic Field’,

http://www.wbabin.net/science/tombe.pdf

it is explained how Maxwell’s molecular vortices might be more accurately represented by rotating electron-positron dipoles in which each electron is in a mutual circular orbit with a positron. In the axial plane of the electron-positron sea, these dipoles will be stacked on top of each other with electrons approximately above positrons hence giving rise to a Coulomb tension along the length of each magnetic line of force.

On this basis, we would have a problem with the concept of variable vorticity in the steady state. The double helix alignment in the steady state would require a fixed vorticity within every solenoidal magnetic line of force.

We must therefore look to a variable magnetic permeability in order to account for variations in magnetic flux density in the steady state, and if we look at the solenoidal magnetic field pattern around a bar magnet, this is not very difficult to visualize.

The magnetic field lines are clearly more concentrated at the poles of the magnet than elsewhere. It should be quite obvious that the density of the vortex sea, as denoted by the quantity μ, is a variable quantity and that this density visibly varies according to how tightly the magnetic lines of force are packed together.

It is the increase of magnetic permeability μ, as magnetic field lines become more closely packed together, that is giving rise to the Archimedes' forces of paramagnetic attraction and diamagnetic repulsion, and not the variation of vorticity **H** as has been suggested by Maxwell and also in "Archimedes' Principle in the Electric Sea" [1] at,

http://www.wbabin.net/science/tombe11.pdf

The Speed of Light

III. The speed of light c can be determined using the equation,

$$c^2 = 1/\varepsilon\mu \qquad \textbf{(3)}$$

where ε is the electrical permittivity, and μ is the magnetic permeability which Maxwell related to the density of his sea of molecular vortices.

Maxwell used the concept of transverse elasticity instead of electrical permittivity and one is related to the reciprocal of the other. We will call the transverse elasticity T and we know that it has got the dimensions of force divided by area, and that it corresponds to the quantity known as Young's modulus. Equation **(3)** can be converted into Newton's equation for the speed of sound and found at equation (132) in Maxwell's 1861 paper. Maxwell used it to show that the transverse elasticity of his vortex sea could be connected with waves that travel at the speed of light [2].

Newton's equation looks like this,

$$c^2 = T/\rho \tag{4}$$

where ρ represents density. This in turn can be converted dimensionally to,

$$\text{Force X Length} = mc^2 \tag{5}$$

Energy has got the dimensions of force multiplied by distance, and so we can see that the famous equation,

$$E = mc^2 \tag{6}$$

is rooted in Newton's equation for the speed of sound. It therefore follows from the above considerations that the speed of light varies with the magnetic permeability of the medium in question.

And based on the argument given in '$E = mc^2$ and Maxwell's Fifth Equation' [2] at,

http://www.wbabin.net/science/tombe14.pdf

it would further follow that the magnetic field **H** as determined by the vorticity of the molecular vortices should also determine the velocity of light. Hence both the variables μ and **H** which determine the magnetic flux density **B** as per equation **(2)** will affect the speed of light and so it can be said in general that the magnetic flux density **B** of a magnetic field will have an effect on the speed of light.

Summary

IV. The magnetic permeability μ varies even within a steady state magnetic field according to the concentration of the lines of force. This variation will affect the speed of light as well as causing the Archimedes' forces of paramagnetism and diamagnetism.

The vorticity **H** (magnetic field intensity) which can vary dynamically with time will also determine the speed of light.

As both the magnetic permeability μ and the magnetic field intensity **H** contribute towards the magnetic flux density **B** then it follows that in general, the speed of light will depend on the magnetic flux density **B**.

References

[1] Archimedes' Principle in the Electric Sea

http://www.wbabin.net/science/tombe11.pdf

[2] E = mc^2 and Maxwell's Fifth Equation

http://www.wbabin.net/science/tombe14.pdf

[3] The Connection between Gravity and Light

http://www.wbabin.net/science/tombe18.pdf