

Centrifugal Pressure in the Aether

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Abstract. It is suggested that the magnetic vector potential A and the electric current density J are effectively one and the same thing. They both represent a flow of aether. As such we can show that the full expression for centrifugal force becomes $\text{grad}(\rho v^2)$ where ρ is aether density. This expression confirms the close link between centrifugal force, kinetic energy, and repulsion pressure.

Aether Density

I. At equation (127) in James Clerk-Maxwell's 1861 paper 'On Physical lines of Force' at,

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

we saw how he used the concept of density of free electricity to account for electric charge. The implication of this was that he viewed electric current as a flow of pure aether. We don't know what the aether is. It is space itself and it is dynamical and compressible. Working on the premises that space is filled with tiny aether vortices, Maxwell obtained the forces of electromagnetism hydrodynamically.

In modern textbooks, electric current is considered to be restricted to the flow of charged particles, and the quantity ρ for charge density is a measure of the number of discrete charged particles per unit volume.

If however, a particle is either a sink or a source in the aether, then the latter view of electric current becomes a special case of the former.

We will consider the quantity ρ to refer to aether density in general. It therefore refers not only to the number of sinks or sources per unit volume, but also to how tightly the aether between them is compressed, or indeed to what degree the aether is compressed in the absence of sinks or sources.

In other words, the electric current density term $\mathbf{J} = \rho\mathbf{v}$ can refer to the flow of charged particles or to the flow of pure aether. In either case, it ultimately refers to a flow of aether and so the electric current density vector \mathbf{J} is to all intents and purposes the same thing as the aether momentum vector \mathbf{A} , which is better known as the magnetic vector potential.

Solenoidal and Radial Electric Currents

II. Electric currents are normally considered to be solenoidal. When this is so, the solenoidal loop of electric current will be interlocked with solenoidal magnetic field lines. Since \mathbf{A} and \mathbf{J} are effectively the same thing, we will have the relationships,

$$\text{curl } \mathbf{A} = \mu\mathbf{H} \quad \text{(The Solenoidal Magnetic Field)} \quad (1)$$

and,

$$\text{curl } \mathbf{H} = \mathbf{A} \quad \text{(Ampère's circuital law)} \quad (2)$$

which in turn leads to the relationships,

$$\text{div } \mathbf{A} = 0 \quad \text{(Maxwell Gauge)} \quad (3)$$

as per equation (57) in Maxwell's 1861 paper, and,

$$\text{div } \mathbf{H} = 0 \quad \text{(No Magnetic Monopoles)} \quad (4)$$

as per equation (56) in Maxwell's 1861 paper.

With radial electric currents such as in the case of gravity, the situation is described by,

$$\text{div } \mathbf{E} = \rho/\epsilon \qquad \text{(Gauss's Law)} \qquad (5)$$

The Vitreous Pulse

III. Other flow patterns are not so easily described and come under the general equation,

$$\text{grad } \rho = \partial \mathbf{A} / \partial t \qquad (6)$$

which corresponds to equation (118) in Maxwell's 1861 paper since the charge density ρ is essentially a measure of aether pressure and hence potential energy.

Equation (6) caters for miscellaneous forms of aether flow such as the compression pulse in rigid body collisions. These compression pulses, known as vitreous pulses, are distinct from the electromagnetic wave. The latter is a propagation of angular acceleration through the aether vortices at a finite speed equal to the speed of light and involving a net flow of aether, whereas the vitreous pulse is probably an instantaneous action-at-a-distance aether shock wave also involving a net flow of aether. It is possible that the Electric Eel fires a vitreous pulse at its victims.

Centrifugal Pressure

IV. In 'Fundamental Torque and the Rattleback' at,

<http://www.wbabin.net/science/tombe37.pdf>

and in 'The Aether in Rigid Body Collisions' at,

<http://www.wbabin.net/science/tombe38.pdf>

it was discussed how there is a very close relationship between centrifugal force which is given the code G2 and the general force

associated with aether pressure at equation (6) above, which is given the code G5.

It has so far been considered that centrifugal force G2 is the radial outward acceleration associated with two bodies which possess a mutual tangential speed.

If we consider the general expression for centrifugal force $+\text{grad}(\mathbf{A}\cdot\mathbf{v})$ which is derived hydrodynamically in section III of ‘Gravitation and the Gyroscopic Force’ at,

<http://www.wbabin.net/science/tombe5.pdf>

and then substitute the \mathbf{A} term with the electric current density term $\rho\mathbf{v}$, we will obtain an equation for centrifugal force in the form,

$$\text{grad}(\rho v^2) = \partial\mathbf{A}/\partial t \quad \text{(Centrifugal Force)} \quad (7)$$

We can see that this is a convective extension of equation (6) and that it contains both G2 and G5. In other words, centrifugal force in its general form is intricately associated with repulsion pressure in the aether.

The Double Helix Theory of Magnetic lines of Force

V. We saw in ‘The Double Helix Theory of the Magnetic Field’,

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

how rotating electron-positron dipoles could be arranged in a double helix fashion to account for the magnetic field. A rotating electron-positron dipole consists of an electron and a positron undergoing a mutual central force orbit such that the rotation axis is perpendicular to a line joining the electron to the positron. If we stack these dipoles on top of each other along their axes of rotation with the electrons placed approximately above the positrons and angularly synchronized in a twisted rope ladder fashion, we will effectively have a helical spring. These helical springs account for the Coulomb tension which runs through magnetic \mathbf{H} lines of force, and \mathbf{H} is a measure of the vorticity of the rotating aether within these dipoles. If the rope ladder untwists, the tension will increase because the electrons will come closer to the positrons above and below them. See Figure 1 below,

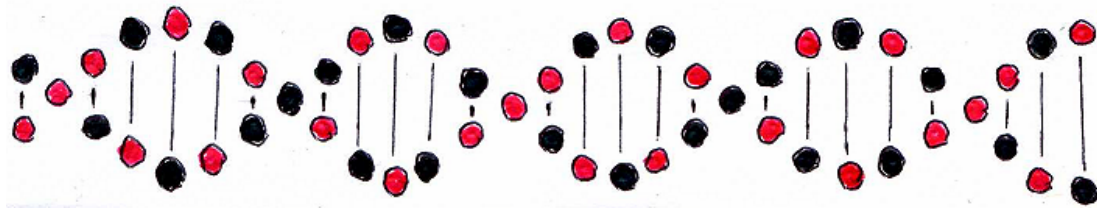


Figure 1. A close-up view of a single magnetic line of force. The electrons are shown in red and the positrons are shown in black. The double helix is rotating about its axis with a prodigious angular speed and the rotation axis represents the magnetic field vector H . The diagram is not to scale as the relative dimensions remain unknown.

The dipoles in adjacent H field lines will be aligned in their mutual equatorial planes and the mutual tangential velocities existing between these adjacent dipoles will cause a centrifugal repulsion to act laterally between H lines. This centrifugal repulsion accounts for both ferromagnetic and electromagnetic repulsion.