# The Double Helix and the Electron-Positron Aether

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Abstract. **This article takes a closer look at the bonding and stability mechanisms within the electron-positron dipole sea and how these result in the double helix theory of the magnetic field [1]. The physical connection between the inertial forces and magnetic repulsion will be further investigated.**
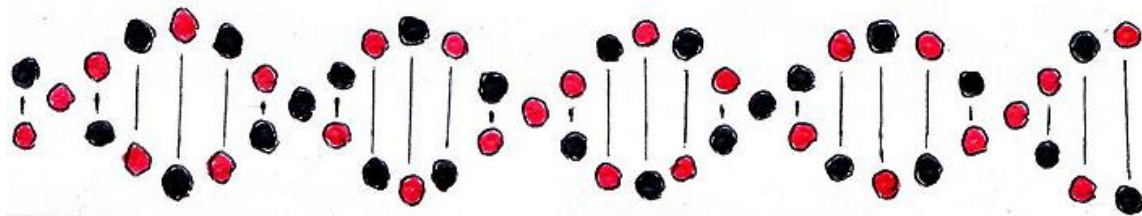
The Inertial Frame of Reference

I. Newton's first law of motion states that a moving body continues along its uniform straight line path unless acted upon by a force. The term *force* in the context naturally excludes the inertial forces since these are actually a consequence of the motion itself. Newton's first law assumes that the concept of straight line motion is already defined and understood, but in order to define it we need to establish a physical basis that will link this law to the inertial forces, because uniform straight line motion involves a centrifugal force to every point in space. This generally unrealized fact is pure geometry, as sure as Pythagoras's theorem. Centrifugal force is angular momentum dependent and it obeys an inverse cube law in distance to the chosen point origin. See section **VIII** below. The physical medium that gives rise to both Newton's first law and the inertial forces will naturally then form the basis for an inertial frame of reference. The concept of an *inertial frame of reference* already exists in relativistic mechanics, but so far it lacks any physical rationale.

It will be proposed that space is densely packed with electron-positron dipoles [1], [2], [3], [4], forming an elastic medium which does not appear to rotate with respect to the average motion of the distant stars, and that this medium will be entrained within the gravitational fields of planetary bodies so as to form inertial frames of reference that will exist in a system of hierarchies throughout the universe. The idealized inertial frame of reference in special relativity is void of gravity, but this is an idealization that never exists in practice.

The constituent electron-positron dipoles that make up an inertial frame of reference will naturally form tiny orbits by virtue of their angular momentum in conjunction with the electrostatic attractive force. They will constitute what is erroneously believed to be *'the annihilated state'* as is officially taught with respect to electron-positron pair annihilation. The question then arises as to how the dipoles themselves will bond with their neighbours. They could attract each other, electron to positron, and form toroidal double helix rings with the attractive force being channelled along the minor axis. Such rings of course would constitute magnetic lines of force, and magnetic attraction would then be reduced to electrostatic attraction acting between electrons and positrons along the double helix. The question would then arise as regards the force that will act between neighbouring dipoles in their equatorial planes.

Centrifugal Force and Magnetic Repulsion

II. Consider two electron-positron dipoles positioned side by side. They each constitute an electron in closed orbit with a positron. They are positioned in the same plane with their rotation axes parallel to each other, and both are orbiting in the same direction. This means that on the near side, the electron or positron of one dipole will pass the electron or positron of the other dipole in the opposite direction. There should according to Coulomb's law be an electrostatic force of attraction acting between two particles of opposite charge. However, when oppositely charged particles from each dipole pass their point of closest approach, they will move apart and then go behind the other two particles, so the electric field lines that may have directly connected between them at the moment of closest approach will be broken.

Let's first consider the situation if we totally ignore the field line patterns altogether. There will be a centrifugal force acting within each dipole such as to balance the electrostatic force of attraction. Mathematically there should also be centrifugal force acting between each pair of particles across the two dipoles. Instinctively we might wonder if the latter could be sufficient to actively push the two rotating dipoles apart. The natural tendency will be to compare the situation with terrestrial objects in relative motion. Two spinning gyroscopes with aligned rotation axes don't push each other apart in their equatorial planes even though there will be a centrifugal force between the elements across each gyroscope. Centrifugal force as we already know is simply a product of following the uniform straight line inertial path and we don't normally associate it with an active push, apart from when it is opposing a centripetal force in a rotating system or in a radial force field.

But in the case of rotating electron-positron dipoles, if these are to form the physical fabric of the very inertial frame of reference relative to which the

concept of a straight line is understood in the first place, then it becomes impossible to define the meaning of the straight line inertial path in the context of the actual constituent dipole particles themselves. Any relative motion, either radial or transverse, between neighbouring electrons and positrons can only be understood in connection with a third particle. And in this respect, the centrifugal force within a rotating dipole that opposes the electrostatic force could also be opposing the electrostatic force with respect to a third particle in a neighbouring dipole. The result could realistically be that neighbouring rotating dipoles repel each other with centrifugal force in their equatorial planes.

It is of course impossible to consider the problem without involving the electrostatic field line patterns, since these are the very essence of space itself. This brings us to the next question. When an electron orbits a positron, do the field lines, which in theory extend to infinity, move rigidly at exactly the same time such as to preserve the irrotational field line pattern? Or is there a field line flow speed which causes a delay and hence a curling effect on the radial pattern? The latter scenario is much more realistic, in which case where two rotating dipoles are positioned side by side and rotating fast enough, when the electron of one dipole flies past the positron of the other in the opposite direction, a situation could arise in which the field lines will never join up. Instead they might sweep past each other side on.

In this case, the dipoles along with their field lines will start to take on the form of vortices, and if space is densely packed with such dipolar vortices, pressing against each other with centrifugal force while striving to dilate [5], [6], [7], hence hemming each other in, the broken field lines in the equatorial plane will have to terminate upwards and downwards with their neighbours in the axial direction. This recalls the Newton's rotating bucket. The vortices will therefore self align into double helix toroidal vortex rings. These vortex rings will form the basis of magnetic lines of force by virtue of channelling the electrostatic force of attraction along the double helix. The pressure emanating at right angles to these magnetic lines of force, due to centrifugal force, will form the basis of magnetic repulsion. The fundamental principle behind centrifugal force is therefore based on the hydrodynamical principle that a flowing fluid cannot move sideways through shear lines. This can be observed in the case of a toroidal vortex in water. The circulating water doesn't fly off at a tangent.

Intrinsic Magnetic Spin Moment

III. The intrinsic magnetic spin moment of an electron and a positron would provide a stabilizing repulsive force in the equatorial plane of rotating electron-positron dipoles which would definitively cause neighbouring dipoles, mutually

aligned in their equatorial planes, to repel each other. Unless we consider magnetic field lines to be completely distinct from electrostatic field lines, the obvious conclusion therefore is that the magnetic spin moment of electrons and positrons is nothing other than the curl of their electrostatic fields, and that the magnetic repulsion arising from magnetic spin moment is in fact caused by centrifugal force.

The Magnetic Field

IV. It is proposed that rotating electron-positron dipoles constitute dipolar aether vortices, with the electrons being sinks and the positrons being sources, and that they are powered up to such high speeds that the centripetal force is not caused by the internal electrostatic attraction within each dipole, but rather that the escape velocity has already been exceeded, and that the centripetal force is caused by the centrifugal force pressing inwards on them by their neighbouring dipoles [8], [9]. The curl in the electrostatic field lines generates centrifugal pressure sideways from the lines and obstructs the aether flow from the positrons to the electrons in the equatorial plane. And as a general rule it is proposed that the flow rate into electrons is greater than the flow rate out of positrons, hence causing a tendency to collapse which can only be prevented by vorticity and hence by centrifugal force. Rotation is the stabilizer of the universe. It is also proposed that curl widens both the sinks and the sources. This latter proposal is significant when it comes to angular acceleration and EM radiation as these involve the overflow of aether from dipole to dipole.

When a source or a sink is placed in a magnetic field, it will be induced to rotate like an idler wheel in the opposite direction to that of the electron-positron dipoles. If the source or sink is then induced to move through the field, at right angles to the rotation axes, the flow will be broken on one side only, hence causing a centrifugal pressure differential at right angles to the direction of motion. This will cause a deflection expressed by the equation $\mathbf{F} = q\mathbf{v}\times\mathbf{B}$ [10]. The deflection will be in one direction for sinks and in the opposite direction for sources. This is because the flow pattern will curl oppositely in each case, even though the spin will be in the same direction. The breaking of the flow on one side, when translational motion occurs, will be on opposite sides for sinks and sources.

When a sink or source that is already spinning is placed in a magnetic field, it will self-align with the magnetic axis. If the field is inhomogeneous, the sink or source will then move towards the appropriate pole, which will be opposite for sinks and sources. This is a kind of Archimedes' principle based on the density of magnetic field lines pervading a sink, as opposed to the density of

magnetic field lines pervading a source. It's a paramagnetic/diamagnetic distinction.

Inertial Centrifugal Force

V. The centrifugal pressure that is being generated by each electron-positron dipole in space will form the basis of the inertial centrifugal force. As bodies on the large scale move through the electron-positron sea, they experience a centrifugal force to every point in space, and this will be due to the rotating electron-positron dipole that exists at that point. This is so whether the motion is directly exposed to the electron-positron dipoles, or whether it is shielded by a gravitationally entrained inertial frame moving within a larger inertial frame. The combined effect of every centrifugal force to every point is the physical cause of Newton's first law of motion. It should be emphasized that centrifugal force is measured relative to a point and is hence derived from a position vector as opposed to a displacement vector. It is therefore camouflaged in terrestrial situations where Cartesian coordinates are used in connection with displacement vectors. The physical importance of inertial centrifugal force mainly emerges in rotating systems and radial force fields where it can actively oppose a centripetal force or displace particles in a fluid as in the case of a centrifuge. Centrifugal force can also reverse the angular momentum in a rotating rattleback [11].

Ampère's Circuital Law

VI. When a particle, neutral or otherwise, moves through the electron-positron sea, it causes the electron-positron dipoles to align with their rotation axes forming solenoidal rings around the direction of motion. This is a fundamental hydrodynamical behaviour as is seen in the creation of smoke rings. Maxwell explains it in connection with Ampère's Circuital Law at equation (9) in Part I of his 1861 paper *"On Physical Lines of Force"* [5], [12].

The angular acceleration which is induced in the immediate electron-positron dipoles is propagated as EM radiation, hence realigning all electron-positron dipoles in the path of the radiation. This means that the inertial centrifugal force experienced by a moving particle is instantaneous with respect to the electron-positron dipoles that it is in immediate contact with, but that it is delayed according to the speed of light for the dipoles further out. In the case of a planetary body, the direct contact will be at the interface of the gravitationally entrained region. Angular acceleration is also the basis for time varying EM

induction, a phenomenon that is paralleled in mechanical collisions when kinetic energy is transferred between two bodies [13]. In both cases, the displacement mechanism associated with the waves is rotational rather than linear. See *"Displacement Current and the Electrotonic State"* [14]. In the case of a linear mechanical spring, the kinetic energy is transferred first from the moving mass to the spring and then into potential energy as the springs stretches or compresses. At molecular level, throughout the oscillating cycle, the individual molecules will be behaving like precessing yo-yos, winding up and unwinding again.

It's this aligning property of hydrodynamical vortices which ensures that all bodies in motion through the background electron-positron sea, and their gravitationally entrained regions where appropriate, will shear their way through with the contact between neighbouring molecules always being in the equatorial plane, such as to generate a hovercraft effect with centrifugal pressure. This generates inertial forces rather than friction, which explains Kepler's laws of planetary orbits.

The Inertial Path

VII. Consider a body in motion in an inertial frame of reference. We write the position vector of this body relative to any arbitrarily chosen polar origin as,

$$\mathbf{r} = r\hat{\mathbf{r}} \tag{1}$$

where the unit vector $\hat{\mathbf{r}}$ is in the radial direction and where r is the radial distance. Taking the time derivative and using the product rule, we obtain the velocity,

$$\dot{\mathbf{r}} = \dot{r}\hat{\mathbf{r}} + r\dot{\theta}\hat{\boldsymbol{\theta}} \tag{2}$$

where $\hat{\boldsymbol{\theta}}$ is the unit vector in the transverse direction and where $\dot{\theta}$ is the angular speed about the polar origin. Taking the time derivative again we obtain the expression for acceleration in the inertial frame,

$$\ddot{\mathbf{r}} = (\ddot{r} - r\dot{\theta}^2)\hat{\mathbf{r}} + (2\dot{r}\dot{\theta} + r\ddot{\theta})\hat{\boldsymbol{\theta}} \tag{3}$$

In the case of negligible gravity where uniform straight line motion occurs, the net acceleration is zero. Conservation of angular momentum means that the transverse component vanishes and therefore,

$$\ddot{r} - r\dot{\theta}^2 = 0 \tag{4}$$

The term $\ddot{r}$, being positive, is the inertial centrifugal acceleration while the negative term $-r\dot{\theta}^2$ must be an equal and opposite inertial centripetal acceleration. The centrifugal acceleration acts to change the radial speed whereas the inertial centripetal acceleration acts to rotate the transverse direction. Likewise in the transverse direction the two terms cancel each other with one of the terms acting to change the transverse speed while the other term acts to rotate the radial direction, hence conserving angular momentum. This is clearly vortex behaviour, and these observations combined with the fact that the choice of polar origin is entirely arbitrary, more or less confirms the original assertion that the inertial mechanism involves a sea of tiny vortices pressing against each other with centrifugal force while striving to dilate and which would cause a pressure to act all around a body [5], [6], [7], [9], [16]. This velocity dependent (inertial) pressure must be the same thing as kinetic energy, because we know that centrifugal force is the radial gradient of transverse kinetic energy.

If we swing a weight on the end of a string, the inertial centrifugal force acting on the weight causes the string to become taut. This induces a tension in the string that causes a reactive centripetal force to act on the weight, which in turn cancels the inertial centrifugal force. Hence we are left with a net inertial centripetal force $-r\dot{\theta}^2$ that causes the weight to undergo circular motion.

The Kepler Orbit

VIII. In planetary orbits, Kepler's second law which is the law of areal velocities tells us that angular momentum is conserved and that hence the transverse term in equation **(3)** vanishes. This enables the centrifugal term to be reduced to an inverse cube law in distance, which is typical of a dipole field. Meanwhile the gravity sinks distort the inertial centripetal force mechanism, and so gravity replaces the inertial centripetal force. Gottfried W. Leibniz (1646-1716), produced the radial planetary orbital equation in the scalar form,

$$\ddot{r} = -k/r^2 + l/r^3 \tag{5}$$

where k is the gravitational constant and l is a constant related to angular momentum. The interplay between the inverse square law gravitational attractive force and the inverse cube law centrifugal repulsive force leads to stable orbits that are elliptical, circular, parabolic, or hyperbolic.

There is considerable resistance in the mainstream literature to acknowledging the inverse cube law repulsive term as a real force, despite the fact that it acts like a force and actively opposes gravity. And it is certainly not an equal and opposite reaction to gravity, as some claim, considering that it is independent of gravity and does not in general have the same magnitude. The cognitive dissonance surrounding centrifugal force is typified in a quote which appeared in a classical dynamics textbook written in 1965 by Jerry B. Marion [15]. Regarding the centrifugal force term in planetary orbital analysis, Marion says,

This quantity is traditionally called the **centrifugal force***, although it is not a "force" in the ordinary sense of the word. We shall, however, continue to use this unfortunate terminology since it is customary and convenient.* Jerry B. Marion, 1965

Conclusion

IX. While it may be possible to establish a formula of words to camouflage centrifugal force in the two body problem, it cannot be camouflaged when applied across multiple pairs of particles in a multi-particle system, such as in the case of two rotating dipoles positioned side by side in their mutual equatorial plane [16], [17], [18]. Centrifugal force forms the entire basis of magnetic repulsion.

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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."

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"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".
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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 articles 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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