Tangential Force – The Equilibrium Shifter

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15th December 2008, Ormoc City, Philippines
(3rd January 2009 Amendment, Oriental Mindoro)

Abstract. This article examines how rotation maintains the balance between positive and negative mass in the universe. It will be concluded that the law of conservation of energy only applies in the absence of tangential forces, and that Lenz's law is an extension of this law which caters for situations that involve tangential forces.

The Electron-Positron Dipole

I. We will begin by considering the most fundamental physical unit of all. That is the electron-positron dipole. We will propose that in a state of zero rotation, the aether will be flowing into the electron at a much greater rate than it flows out of the positron. As such, we will have an overall state of negative mass, and the positron will collapse into the electron.

If we introduce mutual tangential motion and hence tangential aether stress, the electron sink will begin to congest and the positron source will open wider. More mass will then flow into the system. In other words, the tangential force which causes the angular acceleration will act so as to increase the amount of mass, and hence the amount of energy in the dipole system. Rotation is like an inflow/outflow control mechanism. It is like a sliding lid which can't completely cover both the source and the sink at the same time. When the tangential impulse ceases, a new equilibrium state will have been reached, and the overall mass will be less negative than in the zero rotation state. In the new equilibrium state, the inflow and outflow rates will however still be balanced. The outflow from the positron will have

increased. The inflow through the electron will have decreased. But the inflow from gravity will also have decreased so that the combined pressurized flow from the positron and the rarefied flow from gravity will exactly equal the inflow through the electron sink.

If more tangential force is applied, the mass will continue to increase until some point is reached in which the net mass is zero. In that case, the dipole will still constitute a net sink, because the inflow through the electron sink will still be balanced by the rarefied gravitational inflow and the pressurized positron outflow. The difference as compared with the zero rotation scenario will be that the gravitational inflow will be very much less.

In the paper entitled 'Negative Mass and the Gravity Sink' at,

http://www.wbabin.net/science/tombe40.pdf

the question was asked regarding whether or not the electron-positron sea as a whole might have a net zero mass. We cannot be absolutely sure of the answer. We can only be sure that the concept of the electron-positron sea having a net zero mass would not conflict with the idea that the individual electron-positron dipoles constitute net sinks, with the electrons having a slightly greater negative charge than the positrons have positive charge. The balance will be made up for by the gravitational inflow.

It is nevertheless a very strong possibility that the electron-positron sea has a net zero mass in the unmagnetized and unpolarized state, and that electromagnetic photons of positive mass are generated from the positron sources when the electron-positron dipoles are subjected to tangential forces, such as would arise at the side of an increasing electric current.

Another scenario relating to the tangential generation of electromagnetic radiation is that which occurs when an electron and a positron are liberated from the electron-positron sea. They will spiral inwards together under their mutual attraction. The tangential force will cause the generation of centrifugal aether pressure which will increase as the two particles come closer together. When the two particles are once again within their normal distant from each other, as in the bound state, there will be an accumulation of pressurized aether between them that will be in a state of rotation. But rather than causing the two particles to recoil outwards again, as like in an elliptical orbit, the two particles will remain together in circular orbit, and

the rotating pressurized aether itself will radiate away in two directions, in the form of gamma radiation. For the electromagnetic wave propagation mechanism, see section III of 'Cathode Rays, Gravity, and Electromagnetic Radiation' at,

http://www.wbabin.net/science/tombe53.pdf

This tangential principle would not of course apply to the rectangular 'trolley photons' which propagate between two electric wires in a transmission line, because those only involve radial forces. See section **II** of 'Equilibrium in the Electric Circuit' at,

http://www.wbabin.net/science/tombe32.pdf

Negative Tangential Force

II. When negative tangential force occurs, angular deceleration occurs and mass decreases. This can happen when an electric circuit is switched off, resulting in inflowing electromagnetic radiation which takes mass from the magnetized electron-positron sea and injects it back into the electric circuit, hence giving the electric current a last surge forwards.

We also encounter negative tangential force in the case of resinous charge. When a capacitor circuit is being charged, aether is being drawn out of the negative plate. This results in fine-grained tangential aether flow at the atomic and molecular level inside the plate, which reduces the overall state of fine-grained rotational kinetic energy. The negative charge sources will then open wider and the positive charge sources will congest. The gravitational inflow will increase to the extent that the centrifugal repulsive override mechanism will be induced in the electric/gravitational field lines in the space beyond the negative plate. See 'Electrostatic Repulsion and Aether Pressure' at,

http://www.wbabin.net/science/tombe44.pdf

The mass of a resinously charged body will be less positive than that of a neutral body. But again it is hard to be sure whether its absolute mass will be positive or negative. It will most likely be positive.

The mere fact that the electron sink is always absorbing aether at a greater rate than the positron source is emitting it, is not a reason to assume that the net mass is negative. We can have a net positive mass as long as the gravitational inflow and the positron outflow collectively balance the aether inflow through the electron. Compare the situation with a stationary beaker of water that has a sink at the bottom. A tap is pouring water into the beaker at exactly the same rate as the water is falling out the sink at the bottom of the beaker. The inflowing and outflowing water will be in a state of tension, whereas the water in the beaker will be in a state of hydrostatic pressure, and this state of affairs is independent of how much pressurized water is in the beaker.

The Coriolis Force

III. The Coriolis force is a tangential force of the form **F** = **v**X**H** where **H** is vorticity. Its position in relation to the law of conservation of energy is somewhat irrelevant because it is a tangential force which does no work. The law of conservation of energy is about radial forces which do work. The Coriolis force will only ever change the direction of an object. It will not have any effect on the existing kinetic energy or potential energy. The question then arises as to how the Coriolis force actually operates. It operates when an object moves in the equatorial plane of a region of vorticity, such as a magnetic field. But it is unlikely that an object will actually move through the vortex region enclosed by the electron-positron dipoles. It will be more likely that a deflection will occur on confronting the edge of a vortex in the equatorial plane.

Maxwell considered a wire moving in the equatorial plane of a magnetic field. We will use rotating electron-positron dipoles in place of Maxwell's molecular vortices. See **Appendix A** below. As the wire moves, it will be encountering the electron-positron dipoles in their mutual equatorial plane. As such, the wire will be encountering a centrifugal barrier. This will compress the electron-positron dipoles in front of the wire, hence leading to

an increase in their circumferential speed. This in turn will result in a tangential force which will generate centrifugal aether pressure. The electron-positron dipoles behind the wire will be rarefied by the wire's motion, and as such, their circumferential speeds will decrease. This differential vorticity around the moving wire will cause the newly generated pressurized aether to be deflected at right angles along the wire. This right angle deflection is an example of the Coriolis force acting in the face of a centrifugal barrier.

Lenz's Law

IV. The law of conservation of energy (Bernoulli's principle), as between kinetic energy (flow) and potential energy (pressure/tension) only applies when there are no tangential forces acting. The Coriolis force is a tangential force, but it is only a direction changer that doesn't do any work. When we introduce a tangential force that does do work, such as the $\partial\mathbf{A}/\partial t$ force in time varying electromagnetic induction, or the tangential force in motion induced electromagnetic induction as described above in section **III**, then energy has to come from somewhere else.

Lenz's law states that induced electromagnetic effects are such as to oppose the action that causes them. It is not part of the law of conservation of energy, but it is clearly an extension of that law which caters for situations that involve tangential force other than the $\mathbf{v}\mathrm{X}\mathbf{H}$ Coriolis force. Lenz's law caters for both kinds of electromagnetic induction because they both involve the induction of centrifugal aether pressure by tangential force. The Coriolis force then deflects that induced pressurized aether at right angles. Hence, Coriolis force is the right angle deflection which occurs at a centrifugal barrier.

Centrifugal force is in turn a manifestation of positive charge and the inverse cube law aether outflow force. Positive charge and the inverse square law negative charge combine together to give the law of conservation of energy and also the stability node in Boscovich's force law.

The $\partial\mathbf{A}/\partial t$ force is an applied tangential force in electromagnetic induction and in electromagnetic radiation that is ultimately caused by the $+\mathrm{grad}(\mathbf{A}.\mathbf{v})$

centrifugal force. See 'Cathode Rays, Gravity, and Electromagnetic Radiation' at,

http://www.wbabin.net/science/tombe53.pdf

Although it causes a breakdown in the law of conservation of energy in the respect that it generates new aether pressure by tangential action, this effect itself is ultimately a radial force which is then deflected tangentially by the Coriolis force. Energy will have to be drawn from elsewhere in order to obtain the initial applied tangential force, and radial forces lie at the root of the mechanism. This suggests that Lenz's law is an extension of the law of conservation of energy for tangential forces.

Appendix A (Maxwell on Motion induced Electromagnetic Induction)

This is a quote from page 344 in part II of Maxwell's 1861 paper 'On Physical Lines of Force', regarding his explanation of electromagnetic induction as is induced in a wire that is moving in a magnetic field;

In front of the wire, that is, on its east side, it will be seen that as the wire approaches each portion of the medium, that portion is more and more compressed in the direction from east to west, and extended in the direction from north to south; and since the axes of the vortices lie in the north and south direction, their velocity will continually tend to increase by Prop. X., unless prevented or checked by electromotive forces acting on the circumference of each vortex.

We shall consider an electromotive force as positive when the vortices tend to move the interjacent particles upwards perpendicularly to the plane of the paper.

The vortices appear to revolve as the hands of a watch when we look at them from south to north; so that each vortex moves upwards on its west side and downwards on its east side. In front of the wire, therefore, where each vortex is striving to increase its velocity, the electromotive force must be greater on its west than on its east side. There will therefore be a continual increase of electromotive force from the remote east, where it is

zero, to the front of the moving wire, where the upward force will be strongest.

Behind the wire a different action takes place. As the wire moves away from each successive portion of the medium, that portion is extended from east to west, and compressed from north to south, so as to tend to diminish the velocity of the vortices, and therefore to make the upward electromotive force greater on the east than on the west side of each vortex. The upward electromotive force will therefore increase continually from the remote west, where it is zero, to the back of the moving wire, where it is strongest.

It appears, therefore, that a vertical wire moving eastward will experience an electromotive force tending to produce in it an upward current.

See page 344 (page 33 of the pdf link) in part II of Maxwell's 1861 paper 'On Physical Lines of Force' at,

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