

## Rotational and Irrotational Forces

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**Abstract. If we consider space to be dynamical, aether hydrodynamics yields four fundamental forces. These four forces are divided into two groups of two. We have the rotational (or tangential) forces, and we have the irrotational (or radial) forces.**

**Bernoulli, Maxwell and Tesla all believed that space/aether is rendered into tiny whirlpools. As such we need to make a further distinction between forces that arise from aether hydrodynamics on the large scale, and forces that arise from the fine grain vortex aether hydrodynamics on the microscopic scale.**

### Irrotational forces

I. Gravity, electrostatics, and centrifugal force are the irrotational forces. Gravity is the mutual attraction of sinks and it is normally considered on the large scale. Mutual repulsion of two sinks due to fine grain centrifugal force in the sea of tiny aether whirlpools is categorized under electrostatics. See ‘Gravity Reversal and Atomic Bonding’ at,

<http://www.wbabin.net/science/tombe6.pdf>

On the large scale, irrotational forces lead to Kepler’s law of areal velocity and become of importance in planetary orbital theory.

On the microscopic scale, fine grain irrotational forces are important in magnetic force and electric motors. Maxwell showed how the force on a current carrying wire is caused by centrifugal pressure in the equatorial plane of magnetic lines of force pushing the wire from behind. See page 172 (page 12 of the pdf link) in part 1 of Maxwell's 1861 paper 'On Physical Lines of Force',

[http://vacuum-physics.com/Maxwell/maxwell\\_oplf.pdf](http://vacuum-physics.com/Maxwell/maxwell_oplf.pdf)

The tension in magnetic lines of force can be accounted for by the irrotational Coulomb force acting along the axes of the electron-positron double helices that comprise the lines of force. The Coulomb force causes the '*pull*' force in electromagnetism and ferromagnetism, whereas the centrifugal force causes the '*push*' force. See 'The Double Helix Theory of the Magnetic Field' at,

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

In modern textbooks it is customary to teach that magnetic force is caused by the equation  $\mathbf{F} = q\mathbf{v}\times\mathbf{B}$ . This however is only an approximation since it depends entirely on ignoring the magnet field of the test wire. Furthermore, the  $\mathbf{F} = q\mathbf{v}\times\mathbf{B}$  force does not involve a transfer between potential and kinetic energy whereas anybody can see when two magnets are attracted together, that kinetic energy has been converted from potential energy.

Maxwell only ever considered the equation  $\mathbf{F} = q\mathbf{v}\times\mathbf{B}$  force in conjunction with electromagnetic induction. See equation (77) in part 1 of his 1861 paper 'On Physical Lines of Force' at,

[http://vacuum-physics.com/Maxwell/maxwell\\_oplf.pdf](http://vacuum-physics.com/Maxwell/maxwell_oplf.pdf)

## **The Rotational Forces**

**II.** The rotational forces are the Coriolis force and the angular acceleration force. They occur in electromagnetic induction, electromagnetic radiation and in precessing and nutating gyroscopes.

The precessing and nutating pivoted gyroscope in a gravitational field is the large scale manifestation of the Coriolis force. Electromagnetism is the fine grain microscopic manifestation in which case the Coriolis force becomes  $\mathbf{F} = q\mathbf{v}\times\mathbf{B}$ , and the angular acceleration becomes  $-\partial\mathbf{A}/\partial t$ . ( $\text{curl } \mathbf{A} = \mathbf{B}$  where  $\mathbf{A}$  is a measure of aether field velocity and  $\mathbf{B}$  is a measure of fine grain angular momentum of electromagnetic space). It is fine grain electromagnetic Coriolis force that causes the spiral patterns in the weather and in the ocean currents.

## **The Kepler Rotationally Elastic Sponge**

**III.** When large scale irrotational aether flow occurs, the aether will be constantly leaking into the tiny swirling vortices that permeate electromagnetic space. This leakage factor determines the magnitude of the universal gravitational constant/electrical permittivity of free space. The swirling nature of the tiny vortices also substantially absorbs any build up of large scale vorticity, hence leading us to Kepler's law of areal velocity for large scale celestial mechanics.

An aether inflow theory for gravity necessarily implies that space will have vorticity in planetary orbit situations, yet Kepler's law of areal velocity unequivocally tells us that there is no large scale vorticity.

The only solution to this dilemma can be that all the vorticity has been sponged up into the fine grain microscopic vortex structure of electromagnetic space.

The large scale gravitational field on the other hand determines the shape of the magnetosphere around large planetary bodies. The Earth's magnetosphere, with its long tail represents the region in which the Earth's gravity dominates over the Solar gravity. This gives rise to the null result of the 1887 Michelson-Morley experiment.

Einstein's theories of relativity have ignored these considerations, and as such should never have come into existence.