

The 1905 Relativity Paper - Analysis and Obituary

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Abstract

The 1905 Special Relativity paper by Einstein will be analyzed as the classic original source of relativity fallacies and illogic. These pages are often referenced as the authentic source of mathematical and logical support for modern mainstream applications of relativity physics.

But what are the tools that are used in the quest of scientific truth? The scientific method is more than just experimenting; test design and analysis of results using logical realism exposes much of this paper as not only ambiguous but also as promoting the opposite of scientific truth.

The corrections to SR herein lead logically to restoration of Geocentrism, the belief in an Absolute Laboratory Frame and Fluid Aether(ALFA) and replacement of the Big Bang cosmological principle with correspondence to the Book of Genesis.

Einstein does well to distinguish kinematics from dynamics, by organizing the paper into these two major branches of knowledge in experimental and theoretical physics. Failure to make a distinction has led establishment physics into a cauldron of logical confusion. Unfortunately, the coverage of specific topics in the two sections does not execute the intent of the general separation in seeking scientific truth.

Since the distinction between kinematics and dynamics is crucial to the understanding and credibility of this paper, we define each:

Kinematics – a branch of (applied) math dealing solely with description and **measurement of motion**. Possible real-world motions are abstracted with the kinematic variables of t, r, v, \dots in an abstract modeling space. The motion of an atomic electron or a galactic star would have the same point motion in a circle. All physical properties, like mass, are ignored.

Dynamics – a branch of physics dealing with prediction of future motion, based on the Euler-Lagrange equations (the laws of physics) as derived from the Lagrangian variational principle of calculus. Specific real applications for prediction of motion include additional dynamical parameters like mass, moment of inertia, force and torque. Any analysis which contains any dynamic parameters is de facto dynamical. Dynamical models are the **prediction of motion** in real space using the laws of physics.

[ON ELECTRODYNAMICS OF MOVING BODIES](#) *A.Einstein*
June 30, 1905

note: The laboratory reference frame is assumed for measuring motion.
Only sections in the link above (in italics) will be shown.

It is known that Maxwell's electrodynamics – as usually understood at the present time – when applied to moving bodies, leads to asymmetries which do not appear to be inherent in the phenomena. Take, for example, the reciprocal electrodynamic action of a magnet and a conductor. The observable phenomenon here depends only on the relative motion of the conductor and the magnet, whereas the customary view draws a sharp distinction between the two cases in which either the one or the other of these bodies is in motion. For if the magnet is in motion and the conductor at rest, there arises in the neighborhood of the magnet an electric field with a certain definite energy producing a current at the places where parts of the conductor are situated. But if the magnet is stationary and the conductor in motion, no electric field arises in the neighborhood of the magnet.

.....

6- Examples of this sort, together with the unsuccessful attempts to discover any motion of the earth relatively to the "light medium," suggest that the phenomena of electrodynamics as well as of mechanics possess no properties corresponding to the idea of absolute rest.

7- They suggest rather that, as has already been shown to the first order of small quantities, the same laws of electrodynamics and optics will be valid for all frames of reference for which the equations of mechanics hold good.

8- We will raise this conjecture (the purport of which will hereafter be called the "Principle of Relativity") to the status of a postulate.... P1

The Intro

Immediately problems arise even in these opening words which refer to testing of Faraday's Law with Maxwell's electrodynamics.

The clearest way to summarize and remember these tests is with a visual record...as in this video:

[Faraday paradox unipolar dynamo demo Part1](#)

		Lab result	Maxwell Dynamics	Lab frame prediction
Case 1: conductor rotates	$V_c > 0, V_m = 0$	emf	emf	emf
Case 3: magnet rotates	$V_m > 0, V_c = 0$	no emf	emf	no emf
Case 4: both disks rotate	$V_c, V_m > 0$	emf	no emf	emf

Maxwell dynamics predicts $\text{emf} = qV_{c,\text{mag}} \times \mathbf{B}$

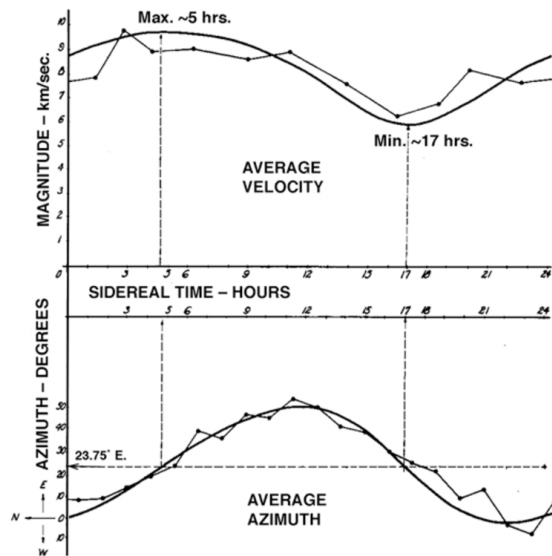
Absolute lab frame predicts $\text{emf} = qV_{c,\text{lab}} \times \mathbf{B}$

The first paragraph acknowledges that the measurements of magnet and conductor relative motion (kinematics) lead to a breaking of symmetry in the emf predicted by the Lorentz force (dynamics). In the lab frame, conductor motion causes an emf while magnet motion does not.

Assertions could be made that:

- the measurement of motion obeys relativity (kinematics) but the application of physical laws (Maxwell dynamics) uses an absolute frame.
- the absolute reference frame in dynamics is the earth/lab reference frame, composed of an observer at rest on earth, a ruler and clock.
- Case 4 of co-rotation (not covered by Einstein) supports the two lines above. The conductor moves in the lab frame; as in Case 3 magnet motion.....and B field line motion... is irrelevant.
- this assertion is supported in Mechanics by Newton's Bucket anomaly. When water co-rotates with the bucket, The centrifugal force law of dynamics correctly predicts the water vortex formation...in the lab frame. The same law applied by an observer on the bucket (a non-lab frame) predicts zero centrifugal force and a flat water surface, contrary to observation.
- Bennett's Hiker in the appendix also supports the earth/lab frame as unique and necessary for prediction of future motion in dynamics.

Sentence 6 – By 1905 the 1887 Michelson-Morley Experiment (MMX) was claimed to have failed detection of the Earth’s orbital motion of 30 km/s through the aether. The test was stated as a ‘null result’, but later tests of greater precision by Dayton Miller found a periodic variation of about 5 km/s amplitude every sidereal day not zero....see graph below The MMX had enough precision to detect the aether motion, but the Nyquist criterion requires sampling the aether waves at least every 12 hours to detect a daily period.



Miller’s aether drift results

Einstein assumes the Earth moves through a rigid aether (heliocentrism) but motion measurements are relative(kinematics), so the motion of 5 km/s could be relative to the Earth(lab frame)...meaning the aether detected is fluid, not solid.

Then it’s claimed that ‘electrodynamics and mechanics possess no properties .. of absolute rest and ...the same laws of electrodynamics and optics will be valid for all frames of reference’. This is refuted by the assertions above regarding the first paragraph and consistency of the lab results with an absolute lab frame.

In the third sentence above an E field is said to arise around the moving magnet, producing an induced current in the stationary conducting disk. The video experiments show that a moving magnet does NOT cause an induced current in a fixed conductor (note: fixed in the lab frame); this statement disagrees with the lab result.

The fourth sentence clearly states a violation of the lab result when the motion is reversed and the magnet is stationary in the lab frame while the conductor is in motion. Both Maxwell’s induction law and relativity of motion predict an induced EMF....but no such induction is observed.

For a fixed magnet and moving conductor in the lab frame:

Both Maxwell's induction law and relativity violate the test results. The following paragraph attempts to explain this contrary result:

In the conductor, however, we find an electro-motive force, to which in itself there is no corresponding energy, but which gives rise – assuming equality of relative motion in the two cases discussed – to electric currents of the same path and intensity as those produced by the electric forces in the former case. P1

Several further comments can be made:

- Equality of relative motion for emf production has been shown empirically false...as is any electro-magnetic argument based on relativity.
- No induction experiments are cited in this paper to support the first paragraph description.
- In fact, no experiments or references are given at all, contrary to prevailing protocols for scientific papers.
- The laboratory is always taken as the fixed frame in the examples. How then can relativity be validly tested if only one frame is always chosen?
- No mention is made of the co-moving anomaly shown in the video, which produces an induction where Faraday's law predicts none (no relative motion).
- Why weren't these issues addressed before?? All the analyses above have been known since 1905.

....Examples of this sort, together with the unsuccessful attempts to discover any motion of the earth relative to the "light medium," suggest that the phenomena of electrodynamics as well as of mechanics possess no properties corresponding to the idea of absolute rest. P1

Michelson-Morley experiment

Einstein interprets the MMX as supporting the laws of physics being inconsistent with absolute rest. But the MMX can be obviously taken as supporting both the Earth and aether as being at rest, if a 'null' result is seen as meaning zero relative motion between the two. Accepting Maxwell's law as valid is the foundation of this paper, yet the Maxwell/Faraday law has been empirically shown to be false. On the other hand, modeling the Earth or the aether as an absolute frame of rest has been rejected without empirical or logical disproof.

Coordinate systems/Reference frames

Koordinatensystem is translated here as 'frames of reference', yet the same word is translated 14 times as 'co-ordinate system' in the rest of the text. Coordinate system applies to a mathematical structure that permits mensuration in modeling space...like Cartesian or polar coordinates.

Reference frames are physical coordinate systems with observers tracking space and time in the real world with rulers and clocks.

The dynamical context does require the use of frames of reference, but Einstein used the term for an abstract kinematic model. There are several German words that express a physical

reference frame... *Bezugsrahmen* , *Bezugssystem* and *Referenzrahmen*. That Einstein does not distinguish the mathematical from the physical or the kinematic from the dynamic is a significant insight into the interpretation of this relativity paper. And why does the translation vary from the original? What other translation 'corrections' have been made to the original document?

We will raise this conjecture (the purport of which will hereafter be called the "Principle of Relativity") to the status of a postulate, and also introduce another postulate, which is only apparently irreconcilable with the former, namely, that light is always propagated in empty space with a definite velocity c which is independent of the state of motion of the emitting body. P1

A constant speed of light c fails optical testing. The second postulate of relativity is refuted by several tests that exhibit anisotropy. These include Michelson-Morley, Sagnac, Dufour&Prunier, Dayton Miller and Ruyong Wang. Any non-vacuum interferometer test can demonstrate the variability of light speed... in gravitational aether fields or in a moving luminiferous medium...aether. Light speed is independent of source and detector...but dependent on the medium/aether.

These two postulates suffice for the attainment of a simple and consistent theory of the electrodynamics of moving bodies based on Maxwell's theory for stationary bodies. The introduction of a "luminiferous ether" will prove to be superfluous inasmuch as the view here to be developed will not require an "absolutely stationary space" provided with special properties, nor assign a velocity-vector to a point of the empty space in which electromagnetic processes take place. P1

The absence of an aether medium implies optical effects have no cause, a realism error with respect to the principle of sufficient causality.

Let us take a system of co-ordinates in which equations of Newtonian mechanics hold good. P2

Kinematics vs. dynamics

Immediately confusion begins. Kinematics measures motion; in this section there should be no reference to the laws of physics, which are predictive in dynamics, not descriptive.

This abuse of fundamentals carries through to this day, where interpretive confusion between kinematics and dynamics permeates theoretical physics.

...The theory to be developed is based – like all electrodynamics – on the kinematics of the rigid body, since the assertions of any such theory have to do with the relationships between rigid bodies (systems of co-ordinates), clocks, and electromagnetic processes. If a material point is at rest relatively to this system of co-ordinates, its position can be defined relatively thereto by the employment of rigid standards of measurement and the methods of Euclidean geometry, and can be expressed in Cartesian co-ordinates. P2

- Electrodynamics based on kinematics is a confusion of separate disciplines, bound to lead to contradiction(s).
- 'Rigid' is defined as 'unable to bend or be forced out of shape; not flexible'.. Within a rigid body, no sound/stress waves are possible (periodic distortions of shape). The concept is totally abstract and unrealistic, since every substance is malleable.
- By excluding contraction or expansion, rigidity is in contradiction to Lorentz contraction as being logically possible within special relativity.
- In 1905 all electrodynamics was not based on the kinematics of the rigid body. See the theories of Franklin, Aepinus, Faraday and Poincare'.

https://en.wikipedia.org/wiki/History_of_electromagnetic_theory

- In a rigid body sound would travel instantly from source to detector infinitely faster than light.
- No rigid body has been discovered in nature...even diamonds can change shape.

Let us take a system of co-ordinates in which the equations of Newtonian mechanics hold good.
P2

This is dynamics, not kinematics; the predictions are based on the laws of physics, not measurements. Only the lab system of coordinates is effective.

Simultaneous events

...We might, of course, content ourselves with time values determined by an observer stationed together with the watch at the origin of the coordinates, and coordinating the corresponding positions of the hands with light signals, given out by every event to be timed, and reaching him through empty space. But this co-ordination has the disadvantage that it is not independent of the standpoint of the observer with the watch or clock, as we know from experience. P2

Einstein's standard for space measurement is defined as an ideal 'rigid rod'. But this standard for time measurement by a physical clock is not defined at all in the simultaneity discussion. The measurement described depends on what is used as a 'clock' or 'watch'. The test is ambiguous.

... We have not defined a common "time" for A and B, for the latter cannot be defined at all unless we establish by definition that the "time" required by light to travel from A to B equals the "time" it requires to travel from B to A. P3

In the presence of aether motion at v , then $T_{AB} = d/(c + v)$ and $T_{BA} = d/(c - v)$

By assuming that $T_{AB} = T_{BA}$ Einstein assumes $v=0$ (aether is at rest or non-existent). But the Michelson-Morley test showed a harmonic aether effect averaging 5 km/s, not a 'null' result. The experimental result contradicts the definition of equal times for opposite paths.

...In agreement with experience we further assume the quantity

$$\frac{2AB}{t'_A - t_A} = c \quad (2)$$

to be a universal constant – the velocity of light in empty space. P3

Later, tests by Sagnac and Dufour&Prunier would establish that Speed of Light (SoL) is not a constant c when the aether speed v is not zero, but given by

$$SoL = c + v$$

The SR postulates

1. *The laws by which the states of physical systems undergo change are not affected, whether these changes of state be referred to the one or the other of two systems of co-ordinates in uniform translatory motion.*

2. *Any ray of light moves in the "stationary" system of co-ordinates with the determined velocity c , whether the ray be emitted by a stationary or by a moving body. Hence velocity = light path time interval where time interval is to be taken in the sense of the definition in § 1.* P4

Postulate 1 and 2 of Special Relativity is disproven by experiments by Ruyong Wang's Fiber Optic Conveyor test exactly one century later, in 2005.

Postulate 1: The Wang test showed that postulate 1 predicted that the Speed of Light (SoL) in the lab frame is $c+v$ as both predicted and measured.

In the glider frame SoL is $c-v$ as predicted but c when actually measured. Postulate 1 is only true in the absolute lab frame.

This result's the same as the Sagnac test, but now for translations, not rotations.

Relativity of motion only applies to kinematics, not dynamics.

Postulate 2: Whenever the glider is in motion relative to the lab frame, $SoL = c \pm v$, not c .

The aether speed v results displays the phenomenon of aether drag by mass motion ... relative to the lab frame!

The Wang test disproves both postulates of relativity.

...The length to be discovered by the operation (b) we will call "the length of the (moving) rod in the stationary system." This we shall determine on the basis of our two principles, and we shall find that it differs from l . P4

If the lengths of the rod change in special relativity, how can the rod be defined as rigid?

...In the first place it is clear that the equations must be linear on account of the properties of homogeneity which we attribute to space and time. P6

A space containing a dynamic aether that varies in optical density and speed (real space) cannot be homogeneous.

Proper time

Between the quantities x , t , and τ , which refer to the position of the clock, we have, evidently, $x = vt$ and $\tau = t/\sqrt{1 - v^2/c^2}$

.... it follows that the time marked by the clock (viewed in the stationary system) is slow by $1 - \sqrt{1 - v^2/c^2}$ seconds per second, or – neglecting magnitudes of fourth and higher order – by $1/2 v^2/c^2$.

P10

This "proper-time" relation between time intervals measured in the rest and moving frames is a critical belief established by experiments like Ives & Stilwell and others.

The proven validity of time dilation is often aligned with length contraction in support of Special Relativity and Lorentz transformations, but –

- The two postulates of SR have no direct relationship to time dilation,
- No experiment has been presented that shows length contraction independently of time dilation.

Maxwell equations

Let the Maxwell-Hertz equations for empty space hold good for the stationary system K, so that we have

$$\begin{aligned} \frac{1}{c} \frac{\partial X}{\partial t} &= \frac{\partial N}{\partial y} - \frac{\partial M}{\partial z}, & \frac{1}{c} \frac{\partial L}{\partial t} &= \frac{\partial Y}{\partial z} - \frac{\partial Z}{\partial y}, \\ \frac{1}{c} \frac{\partial Y}{\partial t} &= \frac{\partial L}{\partial z} - \frac{\partial N}{\partial x}, & \frac{1}{c} \frac{\partial M}{\partial t} &= \frac{\partial Z}{\partial x} - \frac{\partial X}{\partial z}, \\ \frac{1}{c} \frac{\partial Z}{\partial t} &= \frac{\partial M}{\partial x} - \frac{\partial L}{\partial y}, & \frac{1}{c} \frac{\partial N}{\partial t} &= \frac{\partial X}{\partial y} - \frac{\partial Y}{\partial x}, \end{aligned}$$

where (X, Y, Z) denotes the vector of the electric force, and (L, M, N) that of the magnetic force. P12-13

The text says the Hertz equations are being applied, yet these equations contain partial time derivatives, not total ones. Alternatively, there are no convective terms containing the aether speed V and the gradient, like $Vx\partial/\partial x$. The equations displayed can only be Maxwell-Hertz if the aether is rigid ($v=0$). Experiments refute this assumption.

Einstein is clearly using the ordinary Maxwell equations in this section, although the first line calls them the Maxwell-Hertz equations. (If this is a typo, it hasn't been corrected in over a century.)

Rotation in SR

...If we assume that the result proved for a polygonal line is also valid for a continuously curved line, we arrive at this result: If one of two synchronous clocks at A is moved in a closed curve with constant velocity until it returns to A, the journey lasting t seconds, then by the clock which has remained at rest the travelled clock on its arrival at A will be $tv^2/2c^2$ second slow. P11

The assumption that a polygonal line becomes continuously curved (when the number of sides increases without limit and the length of each segment approaches zero) is taken to be true by Einstein... which means Special Relativity holds for curved motion and specifically - for circular motion, which is accelerated motion.

According to Einstein, Special Relativity can be used for accelerated motion when the number of reference systems (later called inertial frames) increases without limit. This contradicts all future interpretations of Special Relativity which claim Special Relativity does not cover circular or accelerated motion.

Special Relativity is not a stable theory - modern versions of Special Relativity conflict with the assumption of Einstein in this paper - Inconsistent theories violate the principle of non-contradiction

...From the equation for ω' it follows that if an observer is moving with velocity v relatively to an infinitely distant source of light of frequency

P16

A light source at infinite distance from an observer can never be seen/detected, since light speed is finite....

Summary:

The paper starts off with confusing fundamentals. Tests of electromagnetism like Faraday induction that challenge Maxwell's laws and relativity are ignored, or treated as if they support Faraday's law of induction.....and relativity. Yet relativity is founded on the validity of Maxwellian electromagnetism - a false foundation.

Here's why.

- The velocity v that produces agreement with Faraday's law represents the speed of charges relative to the lab reference frame, so Maxwell's theory is parametrically incomplete. Since aether is assumed to be rigid/immobile - despite 19th century experiments to the contrary and Maxwell's own aether model of micro-vortices - there is no aether velocity in Maxwell's EM model to measure the experimental speed of aether....only the speed of the charges in the lab frame.
- Maxwell's theory is only tested in the lab frame; validity in other frames of reference is assumed via the concept known as frame independence or covariance. But when the conductor is not in the lab frame, Faraday's law is invalid. This is consistent with Newton's Bucket test; the water vortex is only predicted by the centrifugal force law applied in the lab frame.

Einstein separates kinematics from dynamics , a key distinction for logical interpretation of experiments ...but then ignores the definitions in his analysis.

Test of Faraday's Induction Law:

Maxwell dynamics predicts $\text{emf} = q\mathbf{V}_{c,\text{mag}} \times \mathbf{B}$ **False test results**

Absolute lab frame predicts $\text{emf} = q\mathbf{V}_{c,\text{lab}} \times \mathbf{B}$ **True test results**

The measurement of motion obeys relativity (kinematics) but the application of physical laws(Maxwell dynamics) uses an absolute lab frame. This refutes the basis for SR and is supported in Mechanics by Newton's Bucket anomaly ...and Bennett's Hiker.

Contrary to SR theory...Electrodynamics and mechanics possess properties of absolute rest and the laws of electrodynamics and optics will only make valid predictions for the absolute reference frame, the Earth/Lab/ECEF(Earth Centered, earth Fixed).

Equality of relative motion for emf production has been shown empirically false...as is any electrodynamic theory based on relativity.

No induction experiments are cited in this paper to support the first paragraph description. In fact, no experiments or references are given at all, contrary to prevailing protocols for scientific papers.

The co-moving anomaly shown in the video produces an emf where Faraday's law predicts none (no relative motion) but the absolute lab frame does.

The Maxwell/Faraday law has been empirically shown to be false. On the other hand, modeling the Earth or the aether as an absolute frame of rest has been rejected without empirical or logical disproof.

Michelson-Morley, Sagnac, Dufour & Prunier, Dayton Miller and Ruyong Wang have all established that

$$\text{SoL} = c + v$$

where c is speed in vacuum and v is aether speed in the lab frame.

Constant c fails optical testing of anisotropy with non-vacuum interferometers. Light speed varies with the index of refraction n of optical media, since the medium modifies the aether properties of free space. Vacuum ($n=1$) interferometer tests will fail to detect anisotropy, since there's no mass present to change the aether properties. Vacuum tests which find light speed is constant are pointless; they have no value in determining if the speed of light is always c nor if it follows that postulate 2 of SR is valid.

Empirics show light speed is independent of source and detector...but dependent on the motion of the medium/aether.

Rigid 'rod'

Assumption of rigid rods used in defining length measurements contradicts Lorentz contraction as being logically possible within special relativity. Einstein defines the length standard...rigid rod...but fails to describe the meaning of 'clock'. Consistent with rigidity of length, physical clocks should be independent of external processes, forces and their effects.

If the lengths of the rigid rod change/contract in relative motion, how can it be defined as rigid?

SR postulates:

Postulate 1 is only true in the absolute lab frame.

Relativity of motion only applies to kinematics, not dynamics.

Postulate 2: When the Wang test glider is in motion relative to the lab frame, $\text{SoL} = c \pm v$, not c . Manifested here is the phenomenon of aether drag by mass motion relative to the lab frame!

Time dilation

The "proper-time" relation between time intervals measured in the rest and moving frames, a kinematic rule derived by Einstein, is established by experiments like Ives & Stilwell and others. The proven validity of time dilation is often aligned with length contraction in support of Special Relativity and Lorentz transformations, but –

- The two postulates of SR have no direct relationship to time dilation,
- No experiment has been performed that shows length contraction independently of assuming time dilation.

Conclusion

Analysis of the document's claims reveals astounding misinterpretation of experimental tests of Maxwell's law and Earth motion through aether. When additional evidence from tests since 1905 and logical realism are brought to bear on SR, the theory collapses with certainty.

The result is:

- Restoration of the Biblical assertion of Geostatism(Earth stationary)
- Refutation of the heliocentric model of Galileo/Copernicus
- Establishment of belief in an Absolute Laboratory Frame for dynamical predictions
- Consistent with the laws of physics, both mechanical and electromagnetic.
- Aether as the reference frame for electromagnetic interactions.
- Replacement of the Big Bang cosmological principle with high correspondence to the book of Genesis
- Reasoning based Kinematics and Dynamics must ALWAYS be explicitly stated.
- Relativity of motion only applies in kinematics (data measurements)
- Only the Laboratory Reference Frame is valid in predicting future motion (dynamics)

Physics faced a crisis after 1886, when Michelson-Morley tested for Earth's motion through the static aether. But the 'null' result wasn't zero, but much less than the 30 km/s scientists expected from the heliocentric model.

Miller's thorough aether drift results in 1925 showed the aether isn't constant, but varies at 5 km/s amplitude with sidereal and annual periods. The 1905 paper was in fact based on false premises...such as

- The MMX found zero relative speed between Earth and aether.
- Relativity applied to dynamics.
- The aether did not exist.
- The Earth orbits the Sun.

Why weren't these issues addressed before?? All the analyses above have been known since 1905.

Airy's Failure

in 1871 indicated the Earth was at rest and the aether in motion...15 years before the MMX provided similar proof....but both tests were dismissed by main stream elites for ideological ...and theological...reason. An Earth at rest in a kinetic universe would put the Divine foot back in the door. Despite the global geologic evidence of a world-wide flood, modern scientists only permit models of local flooding

**Since c is not constant and the Earth is immobile and kinematics is confused with dynamics and.....
all of modern dynamics needs to be rewritten...**

Appendix

Now we examine the two Faraday anomalies in detail.

In kinematics measurements of motion can be made by observers in different places and states of motion....as on magnets or disks moving relative to the laboratory/earth frame. If the disk observer measures the magnet is rotating, then the magnet observer measures the same but opposite spin for the disk. This is the kinematic principle of relative motion ...a variant of Mach's Principle. This principle is self-evident; it's irrefutable in the sense that we can't think of how it could possibly be false.

Faraday's Law

is NOT kinematics, but a law of dynamics which predicts an induced force before testing by measurement. In his lab Newton predicted and observed a force on the rotating bucket's water when the water was co-moving with the bucket walls. A Bucket Observer would predict no force on the still water ($v = 0$) in his(bucket) frame ...but the Bucket Observer would still measure the vortex shape and conclude there is a force on the water ...from the measurement, not from the applied prediction of the second law of Newton. Centrifugal force is zero for the bucket frame's water at rest. So Newton and the Bucket Observer agree on the measurements (kinematics) but not on the predicted forces (dynamics).

Note that only the lab frame predicts the observed dynamic forces.

KINEMATICS

Now replace Newton with the Magnet Observer (lab frame) and the bucket observer with the Disk Observer, so we can do EM modeling.

The Magnet Observer measures Disk Observer as spinning; Disk Observer measures Magnet Observer with the same spin...in the opposite sense. Relativity is valid... BECAUSE measured spin is a kinematic variable.

DYNAMICS

The Magnet Observer now goes beyond measurement models and uses – or tries to use - Faraday's law to predict an induced emf because the disk's charges are moving through the B lines. Induction measured? Yes....success.

The converse- the Disk Observer uses Faraday's law to predict an induced emf because the B lines are moving through the disk's charges. Induction measured? NO! Faraday's law fails... This is the same asymmetry as with the mechanical test of Newton's Bucket. The source of the EM field – the free charges - must be moving in the lab frame to produce induction. When the EM sources are at rest in the lab frame there's no induction....magnetic field independence.

Newton's Bucket is a mechanical paradox; Faraday's anomaly an electromagnetic one. Both are resolved using the lab frame as the preferred(only) valid reference frame...in dynamics. Faraday's law must use the lab frame for prediction of induction...

Now consider the co-rotating copper disk and magnet...the case that Einstein skipped. When the disk and magnet are co-resting in the lab frame, there's obviously no induced emf....there's no motion...of anything. The average thermal motion of the electron charge carriers in the disk is zero (else there would be a current). Evidently induction is not possible without motion. But motion with respect to what....in what reference frame?

The claim of inertial covariance is made by the first postulate of relativity....the laws of inertial dynamics are frame and observer independent.

We set both disk spinning at ω and the charges will now be moving in the lab frame. But they won't cross B lines, since there's still no relative motion betwixt disk and magnet. The charges will co-rotate with the B lines. Faraday's law predicts –again – that no induction will occur. But clearly it does occur, violating Faraday's – and by extension – Maxwell's equations.

Because the disk has motion relative to the lab frame, $qV_{con,lab} > 0$an induced emf is predicted.

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Accelerating reference frames in SR

Many authors claim SR does not apply to accelerating reference frames. But Einstein used the calculus of inertial frames to include these in SR. This is just one example of how SR has been modified since 1905 to become a vague collection of individual beliefs.

Tests supporting an Absolute Lab frame and a Fluid Aether...the ALFA Model

Pre 1905 examples of absolute rest in ElectroDynamics : Faraday Law, Airy's failure

Pre 1905 examples of absolute rest in mechanics: Newton's Bucket

Post 1905 examples of absolute rest in ED: Sagnac, Dufour&Prunier, Wang Conveyor

Post 1905 examples of absolute rest in mechanics: Bennett's Hiker

Bennett's Hiker

Take the case of a driver heading north accelerating past a hitchhiker.



If the hiker measures the car's acceleration a and the driver's mass M_d , the second law predicts the inertial force on the driver is F_d where

$$F_d = M_d * a$$

And this is what is measured; it's the familiar inertial force felt by everyone in an accelerating car, the force of the car seat against the back. $F_d = M_d * a$ is both predicted and measured.

The driver and hiker are in relative accelerated motion, so the driver determines the force on the hiker in the same way, but now the driver measures his data, using the car as reference frame. The mass of the hiker is m_h and the acceleration of the hiker is $-a$ or a south, using the kinematic law of relative motion. The predicted force on the hiker by the driver is predicted to be

$$F_h = -m_h * a$$

but... there's no inertial force on the hiker, as we all know from experience. A passing accelerating car may produce a breeze on the hiker, but no inertial force F_h .

$$\Rightarrow F_h = 0 \text{ measured}$$

The acceleration of the passing car has no inertial effect on the hiker, but only on the driver. Not only the 2nd Law is violated, but also the 3rd law of action and reaction.

$$F_{h,d} \neq -F_{d,h}$$

Summary

The hiker uses Newton's 2nd law of physics to predict an inertial force on the driver. This is as observed.

The driver uses the same law of physics to predict an inertial force on the hiker. This is NOT as observed.

Only in the lab/earth/RECEF frame of reference is the physics law obeyed.

In 1905 there was a history of tests that supported absolute rest if a fluid aether was included in the model.

Relative aether-Earth motion tests performed:

- Stellar aberration by Bradley
 - Michelson and Morley non-zero 'null' result'
 - Newton's mechanical test of a spinning bucket
-all supply evidence that the Earth frame is at absolute rest.

The 'asymmetries' in Maxwell's laws are due to performing tests only in the laboratory reference frame and assuming a stationary aether.

Post 1905 tests that support an non-relativistic theory of dynamics:\\Sagnac D&P, Wang

A test following 1905 was Sagnac's EM test of light speed suggesting that the Earth frame is at absolute rest.

References

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