Absolute motion/space is intrinsic, analogous with consciousness; absolute motion does not require absolute space

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Abstract

According to the paradigm that existed for centuries, all thoughts and arguments in favor of (and against) absolute motion have always been associated with absolute space (or the ether) and, in fact, these two concepts have always been inseparable in our thoughts, i.e. 'absolute motion is relative to an objective absolute space'. Reconciliation of the Sagnac effect with Michelson-Morley (MM) experiment null result has always been a daunting task. The Sagnac experiments remained 'impossible' to be reconciled with all theories of relativity. This paper discloses the reason why solving this paradox remained a daunting task for almost a century: it required a paradigm shift!!! In this paper a new paradigm about motion and space is proposed: Absolute motion/ absolute space is intrinsic. Absolute motion is intrinsic to a physical object, just as consciousness is intrinsic to a conscious being. This paradigm may take us a long way, but this paper gives only a hint and much remains to be explored.

Introduction

Even though the notion of absolute motion existed for centuries, the meaning of absolute motion remains unintelligible to this date. The majority of the scientific community rejected its validity/ existence during the last century; however, experiments gave hint on its existence. The Sagnac experiments remained 'impossible' to be reconciled with all theories of relativity. This paper discloses the reason why solving this paradox remained a daunting task for almost a century: it required a paradigm shift !!!

The new theory in this paper has been developed in an attempt to reconcile Sagnac effect with relativity theories (Galileo's invariance principle, Einstein's two postulates and the ' Relativity of EM Fields/ Waves' already proposed by this author.)

Discussion

According to the paradigm that existed for centuries, all thoughts and arguments in favor of (and against) absolute motion have always been associated with absolute space and, in fact, these two concepts have always been inseparable in our thoughts i.e. 'absolute motion is relative to an objective absolute space'. In this paper a new paradigm about motion and space is proposed : Absolute motion/ absolute space is intrinsic. Absolute motion does not require (is not related to) an objectively existing absolute space or medium (the ether). Space is empty. An objective absolute space or medium does not exist. Although absolute space doesn't exist, we imagine an objective absolute space to understand and analyze the effects of intrinsic absolute motion/space. .

We will start from a brief review of previous theories proposed by this author and then discuss the new paradigm. The intention in reviewing previous theories is to bring all about relative and absolute motion and the speed of light to the same point.

1. Relativity of EM Fields/ Waves

Motion of an observer directly towards or away from a light source will result in an apparent contraction of the light (EM) wave towards the source or its expansion away from the source, respectively, resulting in Doppler frequency/wavelength shift. This theory can solve the paradox 'how can two observers moving relative to each other measure the same speed of light ?'. This theory has been proposed [1] as an alternative to the 'length contraction, time dilation' hypothesis in Special Relativity. The speed of light remains unaffected by the relative speed of the observer. Motion of an observer in the lateral direction (relative to a light source) will result in

- Transverse Doppler shift
- A need for modification in the analysis of stellar aberration

2. Proposed experiment to test the ' Relativity of EM Fields/Waves ' theory.

The theory of Relativity of EM Fields/ Waves can be explained as follows:
Imagine a lights source S with a stationary observer A at some distance from the light source S. Imagine another observer B moving with velocity V towards the source. Assume that at t = 0 the light source is emitting (the peak point of) a light pulse. And at this same instant of time (t = 0) observer B is at the same point as observer A, but moving with velocity V towards the source.
The postulate in this theory is that both observers will detect the light pulse after the same time delay! Observer B will not detect the light pulse earlier than observer A (as one would normally expect because B is moving towards the source). This is due to an apparent spacial compression (contraction) or expansion of EM fields/ waves, due to the motion of the observer relative to the source. If the envelope of the light pulse (a video pulse detected by a light detector) was saved and displayed on screens, the pulse received at observer B would be a temporally compressed (Doppler shifted) form of the pulse received at observer A. But both observers would observe the peak of the pulse envelope after the same time delay, but with the width of the pulse received at observer B narrower than the width of the pulse received at observer A.

This theory just follows from emptiness of space. If space is empty, then all observers should measure the speed of light to be equal to C, irrespective of their velocity relative to the source (The second postulate of Special Relativity). (Assuming that the observer and the source have independent motions. This will be discussed later).

Thus an experiment can be performed to prove (or disprove) this theory. If both observers A and B detect the peak of the light pulse after equal delays (at exactly the same instant of time), then this theory proves to be correct. However, the source should be far enough away from the observers, to get a conclusive result.

If the light pulse is emitted from a source (laser light source) located on the moon, the delay will be about one second. Within one second, an aircraft with a velocity of 500 m/s would travel 500 meters. It takes light about 1.6 micro seconds to travel 500 meters.
Thus, the observer (detector) on the aircraft moving directly towards the moon (observer B) is

expected to receive the light pulse 1.6 microseconds earlier than the stationary observer (detector) (observer A) on the earth (according to existing theories of light and space/motion). According to the Relativity of EM Fields/ Waves theory, however, the detector/observer on the aircraft would receive the peak of the light pulse exactly at the same instant that the peak of the pulse is received by the stationary detector/observer A on the ground, but a narrower pulse.

The upper diagram (Fig. 1a and 1b) represents the waveform of the light pulse envelope recorded at the stationary observer A, and the lower diagram as recorded at (by) the moving observer B. Note that if the source was emitting point Q of the waveform at the moment (t=0) that observer B was at the same position as observer A, then both observers would receive point Q on the waveform simultaneously (Fig. 1a). If the source was emitting the peak point P of the waveform at the moment (t=0) that observer B was at the same position as observer A, then both would receive point P simultaneously. (Fig. 1b)

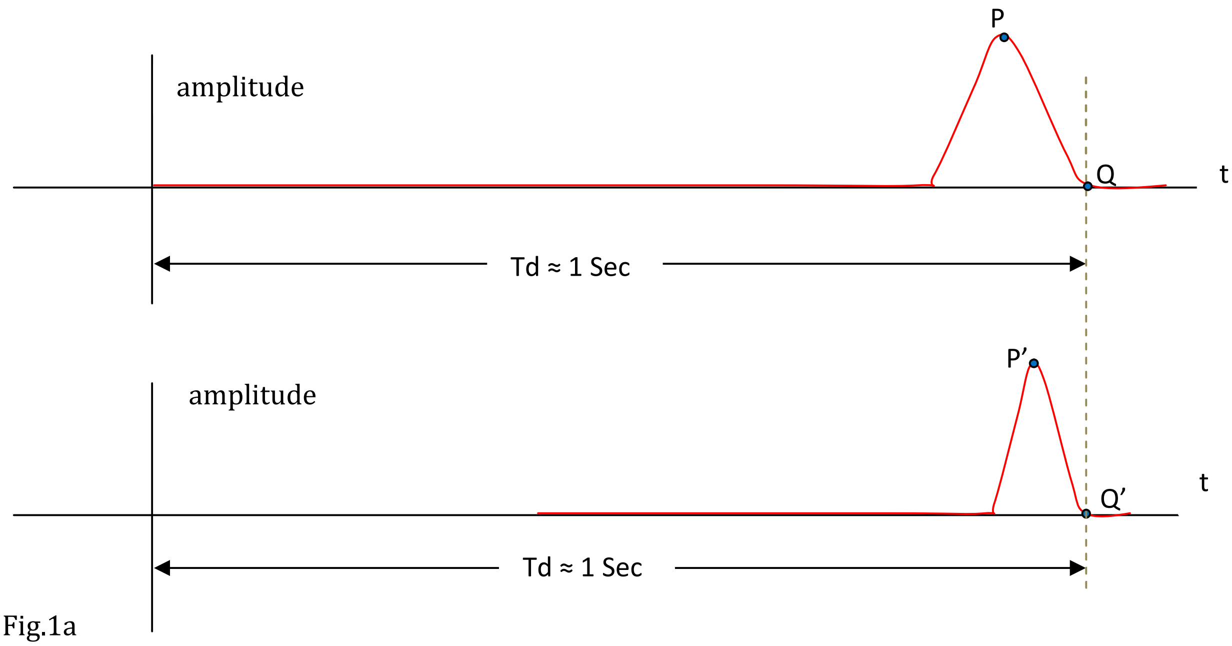

P
amplitude
Q
t
Td ≈ 1 Sec
P'
amplitude
Q'
t
Td ≈ 1 Sec

Fig.1a

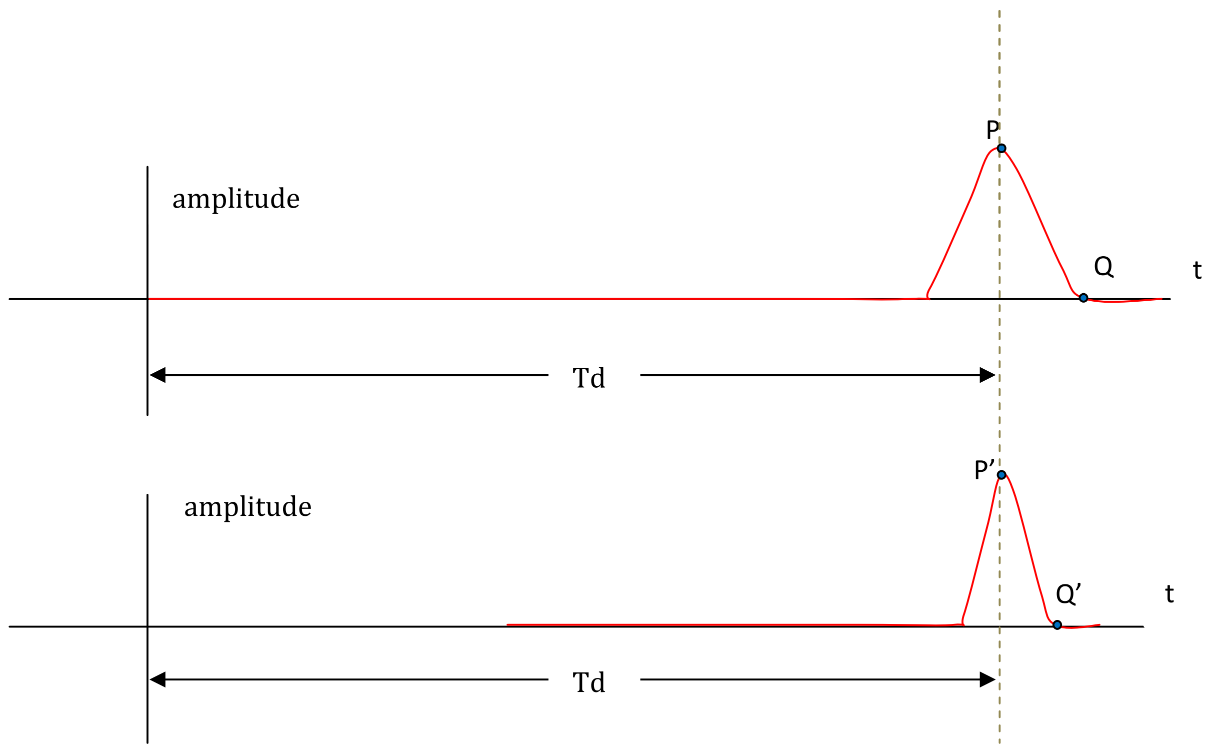

P
amplitude
Q
t
Td
P'
amplitude
Q'
t
Td

Fig.1b

3. In absolute space, Doppler frequency shift can occur even with observer and source are at rest relative to each other.

This will happen while absolute velocity is changing (according to ' Dynamic Absolute Motion' theory). This will be ***acceleration in absolute space***.

For a constant acceleration, Doppler frequency shift will occur in the transient condition until the absolute velocity settles in a final value. This is because, with a continuously changing (say increasing) absolute velocity in absolute space, each light pulse has to travel progressively longer distance before it is observed by the observer, as compared to previous pulses, if the source is behind the observer as seen in the direction of motion. Therefore, even though the source is emitting the pulses at regular time intervals, the time interval between reception of the pulses at the observer will continuously increase from pulse to pulse. Constant absolute velocity results only in time (phase) delay. Changing absolute velocity results both in phase and frequency difference. For a varying acceleration, absolute velocity (obviously) varies and hence Doppler frequency shift will occur even with source and observer at rest relative to each other.

The analysis is as follows:

S O $\longrightarrow$ V_{abs}

Imagine an observer O and a light source S , both in some absolute space with the source S behind the observer as shown.
Assume that S and O are at rest in that absolute space. Therefore, a light pulse emitted by S will be received by O after a time delay of

$$t_0 = D / C$$

If the source emits pulses at regular intervals, the observer will receive those pulses with the same time interval between pulses, but with a time delay, t_0.

Assume now that both the source S and observer O are moving to the right with a constant velocity V_{abs} ; so they will always be at rest relative to each other.

In this case, the time delay before observer O receives a light pulse emitted by S will be determined as:

The total distance travelled by the pulse before it is received by the observer will be

$$D + V_{abs} . (D/C)$$

Thus, the time taken by the pulse before it is observed will be

$$t_0 = (D + V_{abs} . (D/C)) / C$$

$$= D/C . (1 + V_{abs} / C)$$

For a constant V_{abs} the time delay t_0 will be constant. As before, if the source S emits light pulses at regular intervals, they will be received by observer O with the same time intervals between pulses.

But in this case the time delay (phase delay) has increased by $D/C \,.\, V_{abs} / C$
Obviously, no Doppler effect in this case.

Next assume that the absolute velocity $Vabs$ is increasing uniformly. This would be an (constant) acceleration in absolute space, a_{abs}. In this case, the total distance travelled by the pulse before it is observed will be

$$D + V_{abs} \,.\, D/C + 1/2 \,.\, a_{abs} \,.\, (D/C)^2 \qquad \text{(from elementary physics)}$$

The time delay will be determined by dividing the total distance by the speed of light.

$$t_0 = (D + V_{abs} \,.\, D/C + 1/2 \,.\, a_{abs} \,.\, (D/C)^2) \;/\; C$$

$$= D/C + V_{abs} \,.\, D/C2 + 1/2C \,.\, a_{abs} \,.\, D^2 / C^2$$

The two terms D/C and $1/2C \,.\, a_{abs} \,.\, D^2 / C^2$ are constants, so they will result only in time (phase) delay.

Let K_0 be the sum of the two constant terms

$$K_0 = D/C + 1/2C \,.\, a_{abs} \,.\, D^2 / C^2$$

The term $V_{abs} \,.\, D/C^2$ is not constant because V_{abs} varies with time.

For a constant acceleration a_{abs} , the absolute velocity at any time will be

$$V_{abs} = a_{abs} \,.\, t \qquad (\text{ assuming that } V_{abs} = 0 \text{ at } t = 0 \;)$$

Therefore the time varying term will be

$$V_{abs} \,.\, D/C^2 = a_{abs} \,.\, t \,.\, D/C^2 = K_1 .\, t \;, \text{ where } K_1 = a_{abs} \,.\, D/C^2$$

Therefore, the total time delay can be expressed as

$$t_0 = k_0 + k_1 .\, t$$

Assume that the wave transmitted by S is sinusoidal

$$\sin\ (\omega\, t)$$

Now, the wave received at observer O will be

$$\begin{aligned} \sin\ (\omega\, t - \omega\, t0\,) &= \sin\ (\omega\, t - \omega\, (\, k_0 + k_1 .\, t\,)) \\ &= \sin\, (\omega\, t - \omega .k_0 - \omega .\, k_1 .\, t) \\ &= \sin\, (\, (\omega - k_1 .\, \omega\,) .t - \omega \,.\, k_0\,) \end{aligned}$$

We see that the change in angular frequency will be

$k_1 . \omega$, and hence the change in frequency will be $k_1 . f$

The $w . k_0$ term represents a constant phase delay.

Thus we have shown that there will be Doppler effect even if the source and the observer are at rest relative to each other, if they are accelerating (with the same acceleration) in absolute space.

Note that, we mean intrinsic absolute space/motion and not objective absolute space/motion in the above analysis. Objective absolute space does not exist and has been ruled out by the MMX null result.

This theory may explain the ' time dilation' effect observed in Haefel- Keating experiment. Even if the source and detector in the atomic clock are at rest relative to each other, there is a possibility of Doppler effect during transient periods of time. One is the time period until absolute velocity settles in a final value and the other is during periods of acceleration changes of the aircrafts.

4. Absolute motion (velocity) is dynamic

Consider an MM device that has been in uniform rectilinear 'motion' for a long enough time. No fringe shift will be observed in this case. Imagine that the MM device is accelerated with some constant acceleration, a. Then absolute velocity, V_{abs}, will build up gradually as a 'dynamic' time integral of acceleration and fringe shift will be observed and increases as absolute velocity increases. Suppose that the MM device has been in acceleration 'a', for a long enough time. Thus, the absolute velocity no longer keeps on increasing and it will settle on some final value, V_{absf}. Thus, for each value of acceleration ('a'), there will be a final absolute velocity, V_{absf}, proportional to 'a'.

$$V_{abs} = V_{absf} \left(1 - e^{-t/\tau}\right)$$

where $V_{absf} = K . a$, where 'a' is acceleration, K is some constant and τ is the time constant

This theory has already been proposed by this author [2].

4. Absolute motion is intrinsic, analogous to consciousness.

Imagine an observer O and a Michelson-Morley (MM) device (with a light source S and detector D), both inside a space craft moving in space.

At first, suppose that the space craft has been in uniform rectilinear motion for a long enough time. Hence, as discussed above, the absolute velocity of the space craft would be zero. Observer O won't observe any fringe shift. He/ she would measure the speed of light (from S) to be equal to C. Suppose then that the space craft starts accelerating. Hence, as discussed previously, absolute velocity starts to build up. Observer O and the MM device have the ***same*** absolute velocity, V_{abs}. He would observe a fringe shift. You can imagine the observer and the source to be moving in some imaginary absolute space with velocity V_{abs}. Hence, observer O would measure the speed of light to be $C + V_{abs}$ (if the source is in front of the observer, as seen in the direction of acceleration). If the source is behind the observer, he/she would measure $C - V_{abs}$.

Now let us come to the intrinsic nature of absolute motion (velocity).
Observer O measures $C + V_{abs}$ (or $C - V_{abs}$) because the source and observer share the ***same*** absolute motion (velocity). Note that I didn't even say 'equal' , I said 'same'. They share the same absolute velocity : the absolute velocity of the space craft. The space craft, the MM device (with the source S, detector D, the mirrors, the frames) and the observer O move as a *unit*.

Now let us see the distinction in this theory.
Imagine that there is another observer O' in a different space craft, which is at rest relative to the space craft of observer A, but is moving independently. Assume that both space crafts can also accelerate together, but are always at rest relative to each other, but they always have independent motions. i.e. they don't exist/move as a unit.

Assume that observer O' can also measure the speed of light from the source S, which is part of the MM device on the space craft of observer O, and can (some how) also look into the detector on the MM device. Note that the space crafts are not allowed to have any physical contact, and observer O' also is allowed only to look into the detector D (can't have any physical contact with it).
Now, what velocity of light and fringe shift would the observer O' measure ?!

Both observers (O and O') would observe a fringe shift, by looking into detector D. But observer O' can't explain the fringe shift ! For him, the source S is always at the center of the wave fronts, the speed of light is always equal to C, both the forward and lateral beams travel equal distances, . . .

Now suppose that the detector D on the MM device (which was fixed to and moving as a unit with the device) was removed and observed O' tried to observe a fringe shift by using another detector D' (that is inside his own space craft) that is some how placed to detect fringe shift of light from the MM device. Note that the detector D' and the MM device (with detector removed) are on different space crafts, and have no physical contact.

In this case, observer O' would not observe any fringe shift with his own detector D' , even when there is acceleration ! But observer O can observe a fringe shift with detector D that is on his own space craft. The speed of light relative to the detector D depends on the absolute velocity of the MM device, but the speed of light is ***always*** (as far as there is no relative acceleration between the two space crafts, in which case the effect of relative motion would appear : see 'General Relativity of EM waves' theory already proposed) equal to C relative to the detector D'. Therefore, detector D' can't detect the absolute velocity of the MM device.

Observer O' can't observe any fringe shift with his own detector D' and can't explain the fringe shift observed with detector D ! The absolute motion of the MM device is intrinsic to the MM device (to the space ship carrying it) ! Only a detector that shares the *same* absolute velocity as the MM device can detect the fringe shift. Observer O can explain the fringe shift he is observing because he has already detected that he is in absolute motion (he already measured $C \pm V_{abs}$).

Observer O' would observe a fringe shift only if he/she had another MM device *on his own space ship* ! In that case, he would measure only the absolute velocity of his own space craft.

Thus, an observer can observe the effect of absolute velocity ($C \pm V_{abs}$ and fringe shift) only if he/she shares the *same* motion (absolute velocity) with the MM device. The source (the MM device) and the observer share the same motion if both are inside the same space craft. They share the same motion also if they are in different space crafts which have the *same* motion. This can be done only by fixing the two space crafts *rigidly* together. In this case, the two space crafts move as a unit, as a single object.

This is the new paradigm.

5. Assumptions, speculations and reasonings in the development of ' Dynamic, Intrinsic' theory of motion/space

The ' Intrinsic and Dynamic' theory of absolute motion/space presented above was developed in an attempt to reconcile the outcomes of MM's and Sagnac's experiments. The reasonings and assumptions followed in the development of this theory were as follows.

- Absolute motion is related to a *change* in state of motion (acceleration) of an object and has no connection with the motion of that object relative to other objects or relative to a medium (an ether or an absolute space).
- If all inertial observers agree on the motion of an object, then that motion is an absolute motion. Thus all inertial observers agree on rotational motion of an object. All agree on the same angular velocity of that object. Thus rotational motion is always absolute.
- Translational motion is different. Not all inertial observers always agree on the same translational velocity of an object. However, all inertial observers will agree on the same acceleration of an object.
- Now we have to make some logical speculation. If we accept that an object that has been in uniform rectilinear 'motion' for a long enough time *is* at absolute rest, then the acceleration of that object must result in an absolute velocity (as a time integral of acceleration). All inertial observers will agree on this velocity.
- But that (absolute) velocity which resulted from acceleration (as a time integral of acceleration) should not be permanent and static because, if acceleration resulted in a permanent/static absolute velocity, a fringe shift would be observed in the Michelson-Morley (MM) experiment (but didn't). Thus, it follows that absolute velocity must be dynamic (changing). Absolute velocity builds up during acceleration and, if the acceleration lasts long enough, (absolute velocity) settles in a final steady-state value and (absolute velocity) will be discharged/decay gradually towards zero (with some time constant) if the acceleration ceases.

Note that after acceleration has ceased, the object is 'inertial' , but the object will have an absolute velocity until it discharges/decays completely (with some time constant) back to zero.

- The above ' Dynamic' theory can account for the 'null' result of MM experiment. Let us see the paradox that arises, which required the new paradigm: ' Intrinsic' .

The Sagnac effect has been the most difficult and daunting phenomena to be reconciled with any theory of relativity (and MM experiment). Imagine that a miniature MM device is mounted on and rotating with a Sagnac device. We can easily account for the fringe shift detected by the Sagnac device by assuming an absolute space/motion. The forward and backward beams start from the same point in space and, as the detector is in (absolute) motion towards the backward beam and away from the forward beam, the two beams will travel different distances before they arrive at the detector and this will account for the observed phase (fringe) shift. The absolute velocity of the detector (and the source) is equal to the product of angular velocity and radius (ωr). Although there is a fundamentally wrong assumption associated with this analysis (an objective absolute space), this is the simplest and the most straight forward explanation; this same explanation will be adopted with a different paradigm in this paper: an intrinsic absolute space/ motion. The assumption of an objective absolute space results in a paradox because then the MM device would also have the same absolute velocity as the detector of the Sagnac device (ωr) and we would observe a fringe shift accordingly. But according to the 'Dynamic' theory already proposed (and according to the MM 'null' result), this is incorrect and the absolute velocity of the MM device is different in its nature: it depends on the ' dynamic' time integral of its acceleration.

This was a daunting paradox that required a new paradigm that may replace the paradigm that existed for centuries.

The way out of the above paradox is proposed as follows.

Space is empty. An objectively existing absolute space or medium (ether) doesn't exist. But absolute motion exists. So absolute motion must be intrinsic to physical objects! The absolute motion (velocity) of an object is intrinsic to that object.

The Sagnac device as a unit (as a single object) has its own absolute motion: rotation. What is rotating? *The Sagnac device* is rotating *as a unit*. All (inertial) observers agree on its angular velocity. We assume some imaginary absolute space associated with (intrinsic to) the device in which the angular velocity of the Sagnac device is its absolute angular velocity. Then the source and the detector are (absolutely) moving (revolving around the center), in that imaginary absolute space, with velocity equal to ωr. Due to a difference in path length of the forward and the backward beams, then a fringe shift will result. The absolute rotation of the Sagnac device is intrinsic to itself. Even though the MM device is rotating with the Sagnac device, it is not constrained to have the same absolute velocity ωr as the detector of the Sagnac device because the Sagnac device is rotating in its own intrinsic absolute space, and not in an objective absolute space. There is no common objective absolute space in which both the detector and MM device move. Space is empty.

The MM device should also be analyzed in its own intrinsic absolute space. That space is the space in which the velocity of the MM device is its absolute velocity, which is equal to the 'dynamic' time integral of acceleration.

If the same detector was used as part of both devices, it would have different absolute velocities as part of each device. The Sagnac device is rotating in its own intrinsic absolute space and the MM device is translating (moving) in its own intrinsic absolute space. In the intrinsic absolute space of the Sagnac device, the detector is moving with an absolute velocity equal to ωr. In the intrinsic absolute space of the MM device, the detector is moving with absolute velocity equal to the 'dynamic' time integral of its (centripetal) acceleration.

If we say that absolute velocity is intrinsic to the MM device, then this requires that the existence of the MM device as a *unit*. As a unit, all parts of the Sagnac device, i.e the mirrors, the source, the detector, and even the connecting rods ! , 'know' each other ; they are moving as a single unit and are designed and constructed and arranged to detect (absolute) rotation. Even the frame of the device has a fundamental role, the same as that of other parts ! All parts of the device have the same role: detection of rotation. What is detected is rotation of the whole device. The whole device must exist if we are even to talk about its rotation. All parts of the device (the mirrors, the source, the detector, the frame) make up the device, and thus all have a fundamental role. We will discuss the consequences of this paradigm soon.

The arguments can be restated as follows.

Does a Sagnac device exist? Is it rotating? Yes. All observers can agree on these. The observers don't require the existence of absolute space or the ether to know this. So, whether a fringe shift will be observed or not depends on whether the Sagnac device is rotating or not, which in turn depends on the agreement of all inertial observers. The absolute motion of the light source and the detector follows from the absolute rotation of the device.

Does an MM device exist? Is it (absolutely) moving? If all inertial observers accept absolute velocity as a 'dynamic' time integral of acceleration, then they will agree on the absolute velocity of the MM device.

Thus what matters is what all observers agree on the (absolute) motion of a physical object. That motion is absolute motion and is intrinsic to that object. The agreement of all inertial observers on an absolute motion is the beginning of all analysis.

Let us see another consequence of the new paradigm.

Previously we stated that an observer can observe the effect of absolute motion (measuring $C \pm V_{abs}$) only if he/she shares a common (*same*) absolute velocity with the light source.

According to the 'dynamic' theory of absolute motion proposed earlier, an accelerated MM device will be 'charged' with absolute velocity if accelerated and hence will form a fringe shift.

Imagine that the parts (the mirrors, the detector) of an MM device are not rigidly fixed to each other, but assume that the parts are arranged in space to form (rather simulate) an MM device. Assume that each part (mirrors, source, detector) can be accelerated independently. So all parts can be accelerated at the same time with equal (but independent) accelerations, so that they always stay together to form (rather look like) a real MM device. But they don't ***really*** exist as a unit*.*

Then will a fringe shift be observed in this case also ?

According to the 'Intrinsic' paradigm, no fringe shift will be observed even if the parts are accelerated at the same time to look exactly like an accelerated real MM device !

The argument goes as follows.
If an MM device is accelerated, then it will develop absolute velocity and hence a fringe shift. This absolute velocity is intrinsic to the MM device. But an MM device, as a single unit, doesn't exist in the above case. So, we can't talk about (let alone observe) absolute velocity of an MM device when the MM device doesn't exist in the first place. Absolute velocity is intrinsic. This requires the existence of an MM device as a single unit. The parts of the MM device should exist as single unit (as an MM device) by being connected rigidly to each other, arranged properly, for an MM device to exist. A *real* MM device should exist.

If absolute space (or ether) existed objectively, there would be no difference between a real MM device and an MM device with parts not rigidly fixed together. But absolute motion/ space is intrinsic and doesn’t exist objectively.

The same argument can be made about Sagnac device. A fringe shift can be observed only on a *real* (with rigidly connected parts) Sagnac device. Even if parts of a Sagnac device rotate independently and look exactly like a real Sagnac device, the Sagnac device as a single unit doesn't exist ! If a *real* Sagnac device doesn't exist as a unit, to what will absolute rotation be intrinsic?! If we say that absolute velocity is intrinsic, then there must be a physical entity (object) to which it will be intrinsic.
The analogy with consciousness is as follows:
A conscious being should exist in the first place, before we talk about feelings and perceptions. Just as feelings and perceptions are intrinsic to the conscious being (e.g a cat), so is absolute velocity intrinsic to the physical object.

6. An observer can observe directly (with his own detector) only his own absolute velocity (fringe shift).

An observer can see a fringe shift directly (with his own detector) only if he has the *same* absolute velocity as an MM device. Note again the fundamental difference between 'same' and 'equal'. Even if an observer is at rest relative to an accelerating MM device or a rotating Sagnac device, he will not observe any fringe shift *directly* (with his own detector, i.e a detector moving as a unit with him), if he/she does not have the same absolute motion as the MM device. The observer must be on the same space craft carrying the MM device or, in the case of the Sagnac device, the observer should rotate together with the device (as a unit) to observe a fringe shift *directly* (with his own detector).

If an observer observes a fringe shift (absolute velocity) *directly* on an MM device, then that is his own absolute velocity ! If an observer detects a fringe shift (angular velocity) *directly* on a Sagnac device, then that velocity his own (absolute) angular velocity.
An observer can't observe an absolute motion *directly* if he/she doesn't have that ***same*** absolute motion. In effect, this means that an observer can observe *directly* only his own absolute motion.

With this paradigm, absolute motion would be analogous to consciousness. Only the physical object can 'feel', 'perceive' its own absolute motion.

7. An observer who does not have the *same* absolute velocity as a light source can not observe the effects of absolute velocity

Imagine an inertial light source S and an inertial observer O, with independent motions. The observer will always measure the speed of light to be equal to C, irrespective of the relative motion between the source and the observer. If there is relative acceleration between the source and the observer, the observer will measure the speed of light to be different from C.
These have been discussed in the two theories previously proposed by the author: 'Relativity of EM Fields/Waves' and ' General Relativity of EM Fields/Waves'.

If an observer and a light source have independent motions, the observer will observe only the effect of relative motion (Doppler effect, stellar aberration, . . as discussed in the two theories mentioned above) and cannot observe the effect of absolute motion *of the light source*. One effect of absolute motion is measuring the speed of light (from S) to be equal to $C \pm V_{abs}$. The other effect is the source not being at the center of the wave fronts. Another related effect is the anisotropy of the speed of light, relative to the source.
Thus, an observer who has motion independent of the motion of the light source S will not observe

these effects. He/she will always observe the source S to be at the center of the wave fronts, i.e. irrespective of any motion (absolute or relative) (or acceleration) of the observer or the source. Even if an observer just happened to be at rest relative to a source that is accelerating (absolutely moving), he/she cannot observe the anisotropy of the speed of light relative to that source. Thus an observer who is on an accelerating space craft can observe the anisotropy of the speed of light emitted from the space craft, but another observer with an independent motion cannot observe the anisotropy of the speed of light emitted from the accelerating space craft. For him, the speed of light is always equal to C, if he measures in all directions relative to the source, and for him the light source is always at the center of the wave fronts.

8. Effect of source-observer relative velocity when both are moving with the *same* absolute velocity

Imagine an observer O and a light source S, at rest relative to each other, both inside an accelerating space craft, with the source in front of the observer as seen in the direction of the acceleration.

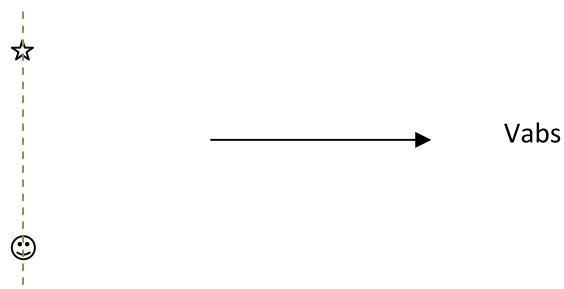
Previously we discussed that the observer would measure speed of light to be $C+V_{abs}$. (And $C- V_{abs}$ if the source was behind the observer). Now, the question is:

What if the observer moves towards /away from the source with relative velocity, V_{rel} (while both are in the same accelerating space ship) ? What velocity of light would he/she measure ? He/she would measure the speed of light to be equal to $C+V_{abs}$, irrespective of the relative velocity V_{rel} ! Therefore, for the positions of the source and the observer shown above, the speed of light is always a constant $C+V_{abs}$! (if the observer was in front of the source, this would be $C- V_{abs}$).

If the relative positions of the source and the observer is at an angle Θ relative to the acceleration (absolute velocity), then he/she would always measure the speed of light C' to be the vector sum of two vectors : C and Vabs, where the angle between the two vectors is Θ, irrespective of any velocity relative to the source.

If the relative position of the observer and the source is lateral to the direction of acceleration (absolute velocity), the observer would measure C' as :

$$C' = (C^2 + V_{abs}{}^2)^{1/2}$$



9. According to the ' Dynamic Absolute Motion/ Space' theory , the absolute velocity of an MM device on the earth will be a dynamic time integral of the centripetal acceleration of the earth due to its revolution around the sun. This acceleration is only of the order of a few cm/ s2 (roughly, say, 3 cm / s2) . It is this acceleration which will be integrated to build absolute velocity of the earth. But we don't know the final value of the absolute velocity for this amount of acceleration, because we don't know the constants K and Tau introduced in the ' Dynamic Absolute Motion ' theory. At this time all we know is that they are some constants; we don't even know what they depend on and their order of magnitudes.

Vabs = Vabsf (1 - e (-t/ Tau)) ,

Vabsf = K . a

where a is acceleration, K is some constant, Tau is a time constant.

These constants can be determined experimentally (assuming the theory to be correct).

However, at this stage we guess that there will be some fringe shift, however small, due to the motion of the earth relative to the sun.

But optical resonator experiments [1] did not detect a $\Delta C/C$ even as small as 10^{-17} ! ! ! that is caused by any anisotropy of light speed due to the motion of the earth.

After developing the ' Dynamic Absolute Motion' theory , I hoped that a very small anisotropy of the speed of light might be detected by accelerating the device (optical resonator). But when I knew that even a $\Delta C/C$ as small as 10^{-17} was not detected, I had to re think about the theory, including its validity. If no anisotropy of the speed of light is observed at a level of 10^{-17} for an acceleration of 3 cm/s^2 , then there will be no hope to detect any anisotropy even if the device (optical resonator) is accelerated with an acceleration as large as 100 m/s^2. However, after some thoughts I found some way out, a hypothesis.

Hypothesis 1

One proposed explanation is as follows.

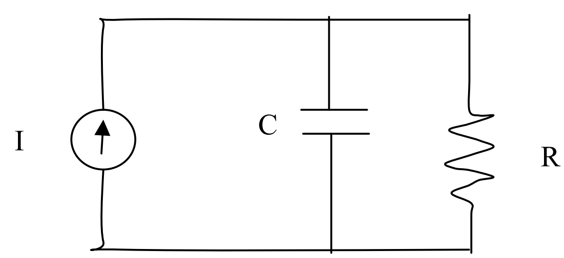
We search for a solution in the equation of ' Dynamic Absolute Space/ Motion' theory.

$$Vabs = Vabsf (1 - e^{(-t/ Tau)})$$

$$Vabsf = K . a$$

where 'a' is acceleration, ' K' is some constant, ' Tau' is a time constant.

The following is a model that greatly simplifies understanding the ' Dynamic Absolute Motion' theory.



The current ' I ' is proportional to acceleration: I α a

' C ' is the capacitance of an object to absolute velocity

'R' is the ' resistance' which 'dissipates' absolute velocity

The constant K determines the final value of absolute velocity, Vabsf, for a given acceleration.
The constant X , together with K , determines the time constant Tau.

If the value X is very large, the time constant will be very large, so it will take a very long time for absolute velocity to build up and this might be the reason for the virtually nil anisotropy of light speed.

So what physical properties might be related to X ? The first thing one would naturally consider is the mass of the object that is accelerating. If the mass of that object is very large, it will take very long time for absolute velocity to build up.

The object under acceleration in MM experiments is the earth and the mass of the earth is enormous. So X will also be enormous. Therefore, even if the earth has some small amount of acceleration due to its motion relative to the sun, the absolute velocity can never build up to a detectable level in the appropriate length of time due to the enormous ' capacitance' of the earth . On top of this is the effect of periodic (yearly) and continuous change in direction of absolute velocity of the earth, so its absolute velocity will never build up in one direction.

Additional factor which should be considered is regarding the direction of absolute velocity. The instrument (optical resonator) should be oriented in the direction of the absolute velocity. The absolute velocity due to the revolution of the earth around the sun is directed towards the sun (if the time constant Tau is small enough), so the instrument should be oriented accordingly.

Therefore, X may be proportional to mass.

$$X = Km \cdot M$$, where Km is some constant.

K might be a property of space and hence the same for all objects.

The unit of K is second. It is an effective amount of time in seconds for the acceleration to integrate to build the final value of absolute velocity.

The time constant

$$Tau = X \cdot K$$

Since the unit of Tau and the unit of K is second , X is unitless.

Therefore, the unit of Km will be kg^{-1}

Now, in the analysis of MMX, which mass will be used : the mass of the earth or the mass of the MM device ?

According to the ' Absolute Motion is Intrinsic' theory (paper) proposed by this author, since the MMX device and the earth are moving as a unit, the sum of their masses will be used in the analysis of the experiment. Since the mass of the earth is enormous, this will be effectively the mass of the earth itself.

We use the mass of the MM device when it is actively accelerated (of course, this is not practical). If an MM device is mounted on a car and accelerated, the sum of the mass of the MM device and the mass of the car will be used in the analysis.

So, if the virtually nil fringe shift in all experiments done so far has been due to the enormous mass of the earth, an experiment can be done by actively accelerating an MM device (or an optical resonator). If the device is mounted on a rocket (to impart maximum acceleration), the total mass of the MM device and the rocket will be used. In this case, the time constant may be small enough for a fringe shift to build up quickly and be observed. If the experiment is sensitive to vibrations, perhaps acceleration due to free fall may be used ?

10 . So, the postulates and hypotheses can be summarized as follows

1. Absolute motion is dynamic

2. All objects moving as a unit have the same absolute motion (rotation and translation), *at all times*. All parts of an object have the same absolute motion.

3. Absolute motion is intrinsic.

Based on these three postulates and hypotheses, we can explain the MMX experiment. Since the MMX is moving as a unit with the earth, it will have the ***same*** absolute velocity and the ***same*** absolute rotation (angular velocity) as the earth, *at all times*. And the absolute velocity of the earth is almost nil according to the hypothesis that the time constant Tau depends on the mass of the object. The MM device can not have any absolute velocity due to rotation of the earth about its own axis, as one would expect because the MM device has centripetal acceleration towards the center of the earth.This can be interpreted as: the earth can not move relative to itself.

Just as one would not talk of absolute velocity of the earth due to its rotation about its own axis, one would not talk of absolute velocity of the MM device due to its motion relative to the center of the earth.The device will have the ***same*** absolute motion (rotation and translation) as the earth, at all times, unless the device is accelerated (rotational or translational) actively relative to the earth. The absolute velocity of the earth comes from its centripetal acceleration towards the sun. Thus, according to the Dynamic Absolute Motion theory, the absolute velocity of the earth is the dynamic time integral of this acceleration.

The paradox of a miniature MM device fixed to a rotating Sagnac device can also be resolved with these postulates and hypotheses.
The Sagnac device and the MM device are moving as a unit. So they will have the ***same*** absolute motion (rotational and translational), at all times. The *unit* is absolutely rotating. So the Sagnac device is also absolutely rotating, hence a fringe shift. The MM device is also absolutely rotating, but this will not have effect on its fringe shift. The unit is not absolutely translating (i.e it is at absolute rest) because we have assumed that it is only rotating. Therefore, the Sagnac device is not in absolute translation. The MM device is also not absolutely translating (i.e its absolute velocity is zero). The unit (and hence the MM device) will develop absolute velocity only if it is accelerated; it will not develop absolute velocity due to rotation. If the unit is accelerated without being rotated, the MM device will detect a fringe shift where as the Sagnac device will not.

Conclusion

The new ' Intrinsic' paradigm about absolute space/ absolute motion presented in this paper is not a mere speculation. This theory evolved as a result of an exhaustive search for all possibilities to explain and reconcile the Sagnac effect with relativity theories. This paradigm may take us a long way, but this paper gives only a hint and much remains to be explored. Any new explanations and clarifications will be presented in future versions of this paper.

Always thanks to God and His Mother, Our Lady Saint Virgin Mary.

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2. ‘ Dynamic Absolute Space’ http://vixra.org/pdf/1305.0014v2.pdf
   and ‘ Dual and dynamic nature of Space/motion’