

Light's Presumed Constancy

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Abstract

It's widely held that light's velocity is constant. It remains the same for everyone no matter their relative motion. It's also widely believed that Einstein proved its constancy. Both of these suppositions are incorrect. In our real nontheoretical world, light's fixed velocity is conceptually impossible. It's mechanically required to compound with any relative motion. This is easy to demonstrate. It's also clearly indicated by all of the Michelson-Morley type experiments and confirmed conclusively by Sagnac's experiment. Moreover, light's velocity is also variable. Its speed changes as it traverses a gravity field, which is routinely observed as gravitational lensing. The problem is, light's factual compounding and variability have devastating consequences for relativity. They completely undermine its underlying premise.

Discussion

In his book, *Relativity: The Special and the General Theory* (Three Rivers Press, 1961), Einstein's reasoning essentially begins with the premise that the speed of light is fixed everywhere for everyone regardless of their relative motion. Meaning that its velocity does not vary or compound with the motion of its source or other reference frames as we'd naturally infer. He never offers an explanation or evidence for why it's fixed. He just states that it is and everyone knows it, admonishing us that even "Every child at school knows, or believes he knows, that [its] propagation takes place in straight lines with a velocity $c = 300,000$ km./sec."

He argues that his theorem of addition of velocities is necessary to prevent the compounding velocity of moving objects from ever attaining the speed of light. The problem is, it's conceptually flawed. It only works in the one linear dimension of motion.

As evidence of his theorem's validity, he cites Armand Fizeau's (a French physicist 1819-1896) experiment. We have to assume it's his famous 1851 experiment. He doesn't say. The way he characterizes it, Fizeau measured an increase in light's velocity when it's shone through flowing water in the direction of its motion as compared to when it's still. He interprets that rate of increase as better matching his formula than that of classic Galilean mechanics.

But since there's no difference in motion in Fizeau's experiment between the light's source and the observer, a compounding of velocity between them is not possible. They're of the same reference frame. So Einstein's addition of velocities theorem, even if it were correct, wouldn't apply.

All that appears to be happening is that the water first slows the light. Its speed in water is about 140,000mi/s. When it's flowing, it's then freed up to increase in the direction of flow. The issue seems to be that the increase does not appear to match the speed of the flowing water as expected. There could be any number of technical reasons that don't involve light's compounding.

The fact is, light has to mechanically compound with all relative motion. Its constancy is simply not possible. Nor is Einstein's theorem of addition of velocities. This can be easily established with just simple, commonsense logic.

Imagine you're in one of Einstein's thought experiments riding a train with a flashlight that you're pointing directly forward. He'd have us believe that to maintain its fixed velocity, the speed of its light would be 186,000mi/s less the train's speed, that the train's rate of time would be running slightly slower, and that it and you would be physically contracting but only in the direction of its motion all to satisfy his assumption of light's fixed velocity. Most of us believe this to be true.

But what would happen if you then pointed another flashlight perpendicular (or at any angle) to its motion? With no contraction or motion in that direction, and with time's "slower" rate, that light's velocity would not only differ from the forward pointing light but it'd exceed 186,000mi/s, the universe's supposed maximum speed limit.

This ordinary circumstance that can't be denied, which should be obvious to everyone but isn't, reveals the irresolvable conflict inherent in light's presumed constancy. Conceptually, in our real physical universe world of three actual dimensions, it cannot be fixed. It's mechanically required to compound with the motion of its source and other reference frames, which completely undermines any argument for its constancy, that in turn completely invalidates relativity.

Apparently, Einstein failed to perceive light's, and time's, innate three-dimensionality but confined his reasoning only to the one abstract dimension of linear motion. He does concede though that if it were found that light's velocity was not constant in all cases then relativity would out of necessity completely unravel. (See **Figure 1** Light's Constancy. To return, click "**Figure**" at the bottom.)

Light's compounding is also clearly indicated by the well-known Michelson-Morley experiment (1887) and all the others like it (Albert Michelson, 1852-1931, & Edward Morley, 1838-1923, were American physicists). It failed to establish the existence of an aether (a theorized universal medium that light was thought to propagate through). What it did show was that the speed of light remained constant when comparing its velocity in the direction of the Earth's orbital (and rotational) motion to that in the perpendicular direction, demonstrating that it always leaves its source at the same rate in every direction at the same time.

The construct of their experiment basically consisted of sets of mirrors perpendicularly arranged an equal distance from a central beam splitter in a cross fashion on a table that can be rotated so that a recombined beam of light

would show an interference pattern if its velocity changed when aligned in the direction of the Earth's orbital motion. (See **Figures 2, 3, 4, 5** Michelson-Morley - Conceptual Diagram & **Figure 6** Michelson-Morley Experiment)

Sagnac's experiment also confirms light's compounding with motion. Georges Sagnac (a French physicist 1869–1928) devised an experiment in 1913 that he thought would prove the existence of an aether, while also disproving special relativity. He believed he succeeded.

The construct was not that dissimilar from Michelson-Morley's. In concept, it essentially consisted of a source that sent light through a beam splitter that separated it in opposite directions, routing it to several mirrors located around the perimeter of a rotating platform that formed the corners of a closed loop that returned the light back to its entry point where the recombined beams would create an interference pattern if their velocities were different.

When the platform was not rotating, no interference pattern was observed. The light took the same amount of time to reach the detector in each direction despite all of the Earth's motions (its rotational and orbital, our solar system's motion through the galaxy, and our galaxy's motion through the universe). This was the same result as Michelson-Morley's.

When it was rotating, the recombined beams did produce an interference pattern. Sagnac concluded that light's velocity is independent of the motion of its source. That's actually not correct. Light always leaves its source at 186,000mi/s in all directions at the same time. Its velocity always gets added or subtracted to the relative motion of other reference frames. It compounds. His and Michelson-Morley's experiment clearly establish this.

When the platform is not rotating, the light departs its source at 186,000mi/s and it remains the same in both directions after it's split. The moment it leaves its source, its motion defines it as a different reference frame. But it's moving in unison with the platform (and the platform is moving in unison with the Earth). There's no compounding of velocities. So the light in both directions reaches the detector at the same time and no interference pattern is created.

When the platform is spun, though, light's velocity is compounded with its

rotation. This is what's responsible for the interference pattern. The light still leaves its source at 186,000mi/s and it still acts as an independent reference frame. But the platform's rotational or angular velocity, ω , is added/subtracted to the light's velocity.

When the light gets split in opposite directions, it in essence creates two different reference frames from the initially emitted light. The light split in the forward direction travels at $c + v$. The light split to the rear travels at $c - v$. Both beams reach the detector at the same time. But their different velocities cause them to be out of phase. So an interference pattern is created.

Another way to interpret it is that a Doppler shift occurs between the two beams. (A Doppler shift is a change in frequency due to the motion between a source and an observer.) The forward split light's faster compounded velocity causes it to be slightly blueshifted relative to the rearward light. Or the other way around, the rearward split light's slower compounded velocity causes it to be slightly redshifted as compared to the forward split light. Any way you look at it, their relative shift in wavelengths have them out of phase at the detector, which produces an interference pattern.

In another one of his many invalidating contradictions, Einstein apparently came to the same compounding-of-velocities conclusion when investigating the effect. He decided that for accelerating frames of reference "the principle of the constancy of light must be modified." In other words, it doesn't work and needs to be scrapped.

The most common explanation for the Sagnac effect does not incorporate a compounding of velocities. It never addresses the emitter and beamsplitter's constant rotational velocity that would normally be imparted to its light. It's just ignored. This causes different arrival times that produce an interference pattern. But light always leaves its source at 186,000mi/s in all directions at once. Michelson-Morley and Sagnac when not rotating plainly demonstrate this. And every source is in motion. So that motion has to be accounted for. Either it's compounded or light's velocity has to be metaphysically modified similar to what special relativity does.

But special relativity fails completely as an explanation of the effect for both the rotating and nonrotating conditions. It's inherently flawed. Conceptually, it only addresses an environment in one dimension, the direction of motion. In every other direction, it's irreparably conflicted.

For the nonrotating condition, light's velocity in the perpendicular direction (or at any angle other than directly forward) would be greater than the forward direction, exceeding 186,000mi/s. Time dilation's innate three-dimensionality and length's one-dimensional contraction maintains its fixed velocity only in the one dimension of linear motion. But in the other two dimensions of our real world, it's unworkable. Light's velocity in those dimensions would contradictorily be increasing. If relativistic effects were actually conceivable, this would create conflicting velocities that would produce an interference pattern for the nonrotating condition just like what was demonstrated in the diagram for Michelson-Morley.

For the rotating condition, special relativity would theoretically compound the platform's rotational velocity with light's velocity. But it enforces the assumption of light's constancy by reducing its velocity by the amount of the rotational velocity in the forward direction and increasing it by the same amount in the rearward direction. This maintains light's fixed velocity and produces the same result, different arrival times that create an interference pattern.

But relativistic effects always produce the same contradictory results. The spinning platform's time is required to slow, it's one reference frame, while its perimeter around its circumference is required to contract. But its interior does not. Its radius remains the same. That's not possible.

Moreover, Einstein asserts that special relativity is only valid when gravity fields are disregarded because of light's variability in them. So if his principle of equivalence were actually true and rotation's centrifugal force actually did produce gravity then light's constancy, time's dilation, length's contraction, and the increasing mass of accelerating objects cannot even be considered as an option to explain the Sagnac effect. Its associated rotation would be producing

centrifugal gravity where light's velocity varies, which would preemptively nullify its constancy and special relativity's relativistic effects.

Trying to explain the results through his principle of equivalence doesn't work either. It's also entirely unfeasible. Light's slower velocity in the rotating experiment's centrifugal gravity field would presumably account for the disparity that causes the interference pattern. But it can be easily shown that rotation doesn't create gravity. So Einstein's principle of equivalence is not an option.

Relativity's simultaneity has also been proposed as a possible explanation. But it also doesn't work. It's fundamentally flawed as well. Any factual review quickly reveals its obvious failures. But it also requires too much off-topic background for this discussion. A cursory but objective investigation will certainly be enough for those seeking further explanation. (See **Figures 7, 8, 9, 10** Sagnac Effect - Conceptual Diagram)

Not too long after presuming light's constancy as the basis for relativity, Einstein changed his position. He decided that the speed of light is actually variable. Its velocity changes as it traverses a gravitational field. Many have difficulty believing this. They've bought the popular narrative that he proved light's velocity is fixed. (A gravitational field can be generally defined as the region surrounding any amount of mass, including subatomic particles, that exerts an "attractive" influence on other mass. Mass is the property of a body that is commonly taken as a measure of the amount of material or matter it contains and causes it to have weight in a gravitational field. Matter is physical substance. Physical substance is a relative term, though. At what point does a subatomic particle's electromagnetic field stop and its physical substance begin? It doesn't. It has no surface. It's only field. And it keeps condensing to some maximum density at its center that is continuously changing depending on its environment.)

For his explanation of starlight's displacement observed during the 1919 eclipse that supposedly confirmed general relativity, he correctly concludes that: "A curvature of rays of light [through the Sun's gravity field] can only take place when the velocity of propagation of light varies with position." This is

essentially refraction. The problem is, just like with its compounding, its variability fundamentally invalidates relativity's founding premise. (Refraction can be defined as light's displacement due to a change in its velocity due to a change in the density of the medium it's traversing.)

But he never reverses his position on its constancy. Just the opposite, he maintains that both are true despite the nullifying contradiction. His ad hoc, after the fact rationalization has him suggesting that it's otherwise fixed, varying only at "existing" gravitational fields, which doesn't make any sense. All gravitational fields are existing. He tries to argue that special relativity is still valid despite light's variability because "its results hold only so long as we are able to disregard the influences of gravitational fields." How does that work?

Where are the locations or conditions under which the effect of gravitational fields can be ignored? Whether it's at the subatomic level or the self-gravity of our entire (presumed) finite universe, aren't gravitational fields everywhere? Don't they surround and permeate every object and extend indefinitely? So how can they be disregarded? They can't.

Which means light's velocity has no possibility of ever being fixed (if it weren't already conceptually impossible). It has to vary everywhere. And that's in addition to its compounding. Without its underlying premise, how can relativity, or any of its ancillaries like the Lorentz transformation or Einstein's theorem of addition of velocities, have any validity? They all become nothing more than theoretical contrivances that have no practical relevance. (Hendrik Lorentz was a Dutch physicist 1853-1928. The Lorentz transformation is a system of equations Einstein used to accommodate the negative results of the Michelson-Morley experiment that calculated the presumed contraction of objects in the direction of motion. Einstein adopted the equations for relativity.)

Einstein would have to agree. He qualifies his assertion of light's variability: If we're unable to disregard the influences of gravitational fields (as we just reasoned) then "the special theory of relativity and with it the whole theory of relativity would be laid in the dust." Our entire cosmology, including the big

bang, is rooted in a theory whose originator reasons is altogether untenable. (See **Figures 11** Light's Bending & **Figure 12** Light's Refraction)

All those airborne clock experiments that are presumed to confirm light's constancy, where it's believed that it forces time's slowing with motion as compared to ground-based clocks have perfectly rational and natural explanations that don't include special relativity's metaphysical phenomena. The effect of the Earth's magnetic field on an atomic clock's cesium atoms is the obvious explanation of the results. Their motion through it infuses them with a charge that slightly increases their size and mass, which slows their natural frequency that in turn slows their clock's rate of operation, not time's rate.

Those other experiments that presumably demonstrate time's increasing rate with elevation are actually recording a slight increase in the cesium atoms' natural frequency due to their contraction in the ever-decreasing density of the Earth's magnetic field. This is what's actually increasing their clock's rate of operation with elevation. It's not time's increasing rate.

For much higher altitudes/distances, the Earth's very much stronger gravity field begins to govern. As a clock moves farther away, its cesium atoms begin to enlarge in the ever-increasing density of the Earth's gravity field. They also acquire a charge from their motion through it. So both cause a slight increase in their size and mass that decreases their natural frequency that in turn slows their clock's rate of operation, not its rate of time.

Light's variability also affects the readings of all these experiments. Its velocity propagates slower as field density decreases and faster as it increases. If fields and their density affect the natural frequency of subatomic particles/atoms then how can atomic clocks remain unaffected by their position and motion through them? They can't. (See **Figure 13** Field's Effect on Size & **Figure 14** 1971 Hafele & Keating Airborne Clock Experiment. For more on field density see *Nontheoretical Gravitation* in viXra.org e-Print archive)

Conclusion

It's conceptually impossible for light's velocity to remain fixed. Simple logic and the most relevant experiments clearly demonstrate that it's mechanically required to compound with the relative motion of other reference frames. And that's in addition to its widely accepted but also contradictory variability that undermines its constancy as well. Without it, relativity's tenability vanishes.

Coda

Light's presumed constancy has become myth, the foundational premise of an illusive big bang-relativity cosmology that's overtly unworkable at its core. But mesmerized by relativity's mysticism and rendered impotent by a pandemic of frenzied groupthink, we can't see it. We're totally blind to its underlying absurdities. So instead of first pursuing the obvious, practical, and often mundane, we delusively rush to shore up its incoherent dogma while self-righteously suppressing any alternative that poses a threat to the status quo. It's classic confirmation bias taken to the extreme.

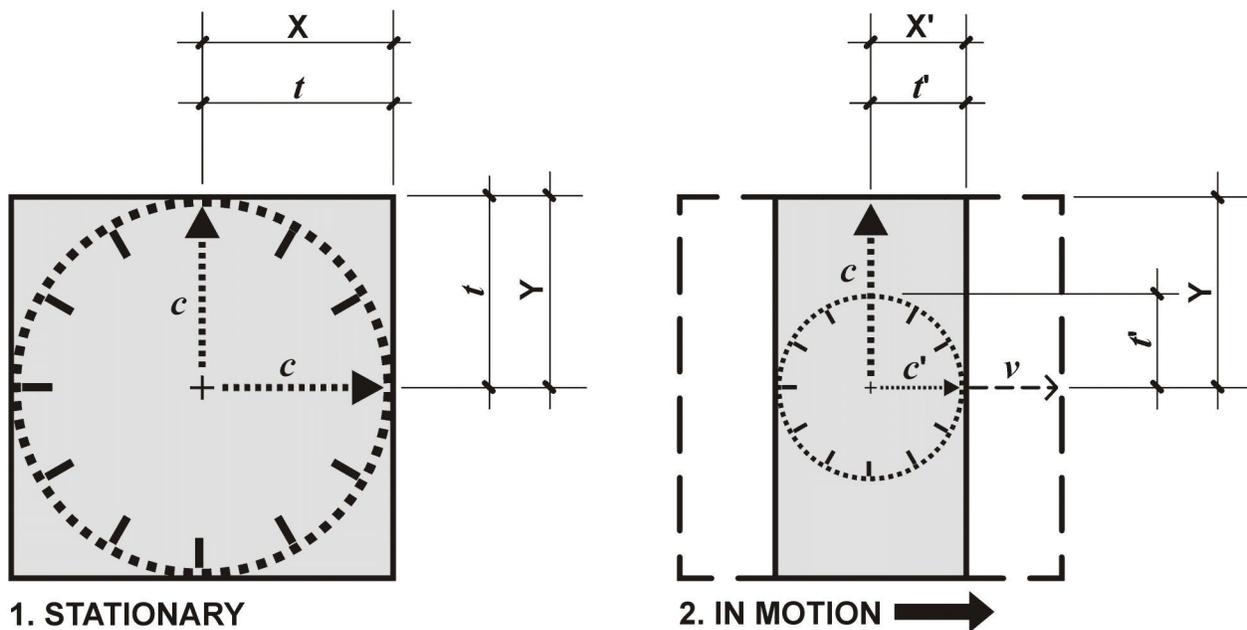
Bibliography

Arp, H. *Seeing Red: Redshifts, Cosmology & Academic Science*. Montreal: Aperiron, 1998.
Einstein, A. *The Meaning of Relativity*. Princeton: Princeton University Press, 1953.
Einstein, A. *Relativity: The Special and the General Theory*. NY: Three Rivers Press, 1961.
General Reference. *Science News*, 1999 - 2018.
General Reference. *Scientific American*, 1994 - 2022.
General Reference. *Sky & Telescope*, 2000 - 2022.
General Reference. *Wikipedia* (<https://www.wikipedia.org>), last access 2022.
Gonder, K. *The Reality of Relativity* (7.4 032922). Amazon/B&N (LCCN: 2020901711), 2018.

Declarations

The author certifies that he did not receive any funding, grants, or any type of support from any individual or organization in the connection with the study or preparation of this work. The author further certifies that he does not have any financial or competing interests in connection with this work or ties of any kind to any individual or organization that might.

Diagrams (Beginning on next page)



LIGHT'S CONSTANCY

A simple way to illustrate the impossibility of light's fixed velocity is by establishing a two-dimensional square reference frame, as depicted in diagram 1, that could be of any size. When theoretically stationary, its X and Y dimensions from its center would correspond to light's constant velocity, indicated by the arrows at c , and time's constant rate, symbolized by the clock-like circle that fills the entire reference frame equally that equates to t .

It's important to establish at the beginning that in reality, there is no such thing as "time." It is not an independent property of the universe. Nor can it change with an object's motion. We define time by choosing an object with periodic motion to use as reference. The Earth's day and year are most common. So from the outset, light's assumed constancy enforced by a nonexistent time's slowing can have no validity and our discussion has to remain purely theoretical with no practical relevance. But let's go ahead anyway and demonstrate the fallacy of light's constancy as if time were real.

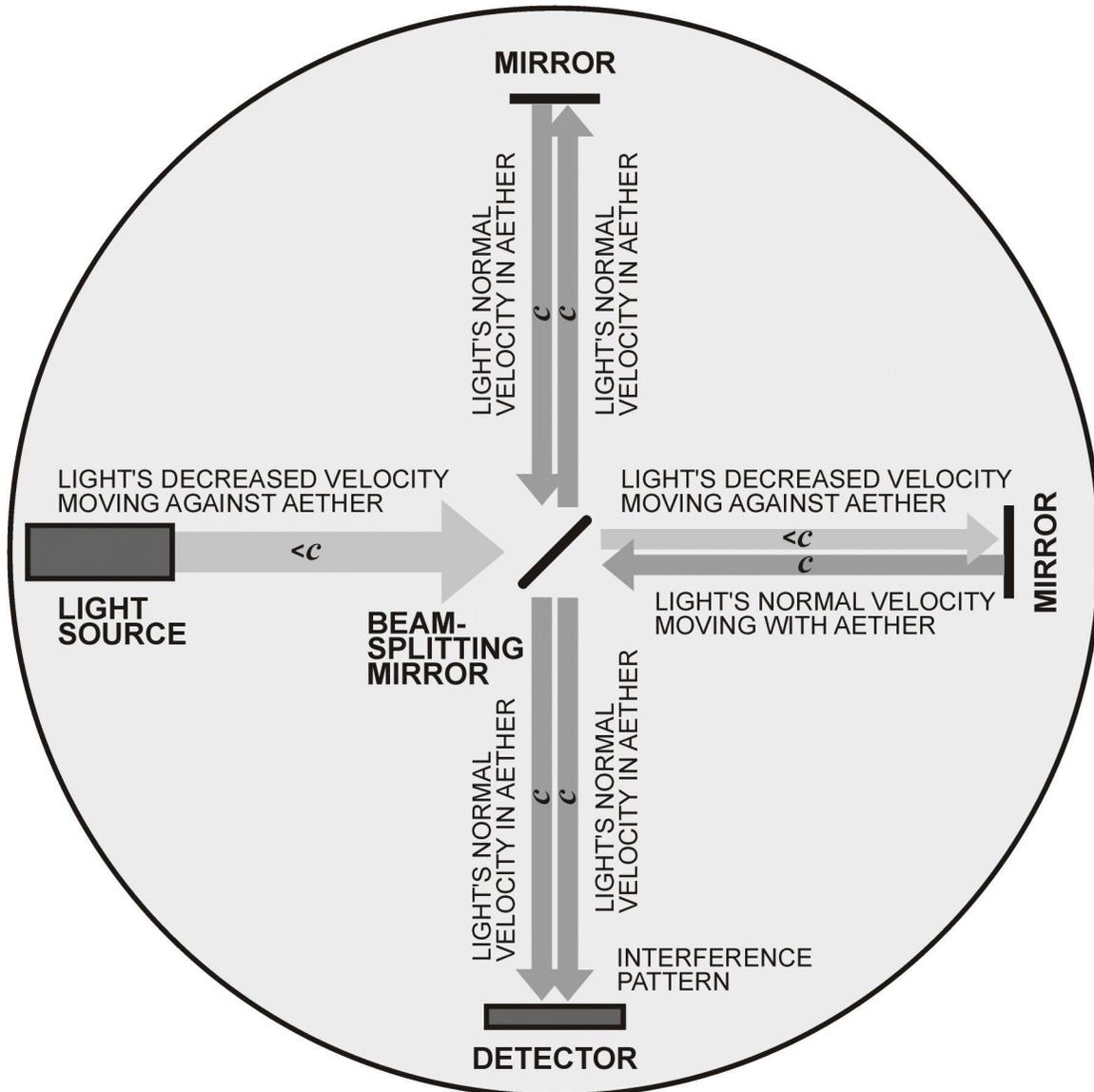
When our reference frame is put in motion, let's say moving from left to right at velocity v , as depicted in diagram 2, for light's velocity to maintain its constancy in the direction of motion, it would have to slow in that direction by the amount of the reference frame's velocity to c' . This would require the reference frame to contract correspondingly in the direction of motion to the distance X' while its rate of time also contracted equivalently to t' , as suggested with the smaller clock-like circle.

But since there's no motion in the perpendicular direction, our reference frame's Y dimension and light's velocity, c , are not required to contract to maintain its constancy. And since time's smaller rate, t' , has to apply equally over the entire reference frame, this creates an unresolvable conflict in every direction other than directly forward, as indicated by the smaller clock-like circle. Its contracted time, t' , corresponds to the contracted X' dimension and light's contracted velocity, c' , in the direction of motion. But in the perpendicular direction, its contracted rate conflicts with the noncontracted dimension at Y and light's noncontracted velocity at c , which would cause it to exceed 186,000mi/s.

This clearly shows how light's velocity can only remain fixed, theoretically, in the one abstract dimension of linear motion. Even if time was an actual constituent of the universe, it's conceptually impossible in two or the three actual dimensions of our real nontheoretical world, which unequivocally affirms light's compounding with the motion of its source that in turn completely undermines every aspect of relativity by invalidating its underlying premise, light's constancy.

(3.1 Light's Constancy 5a)

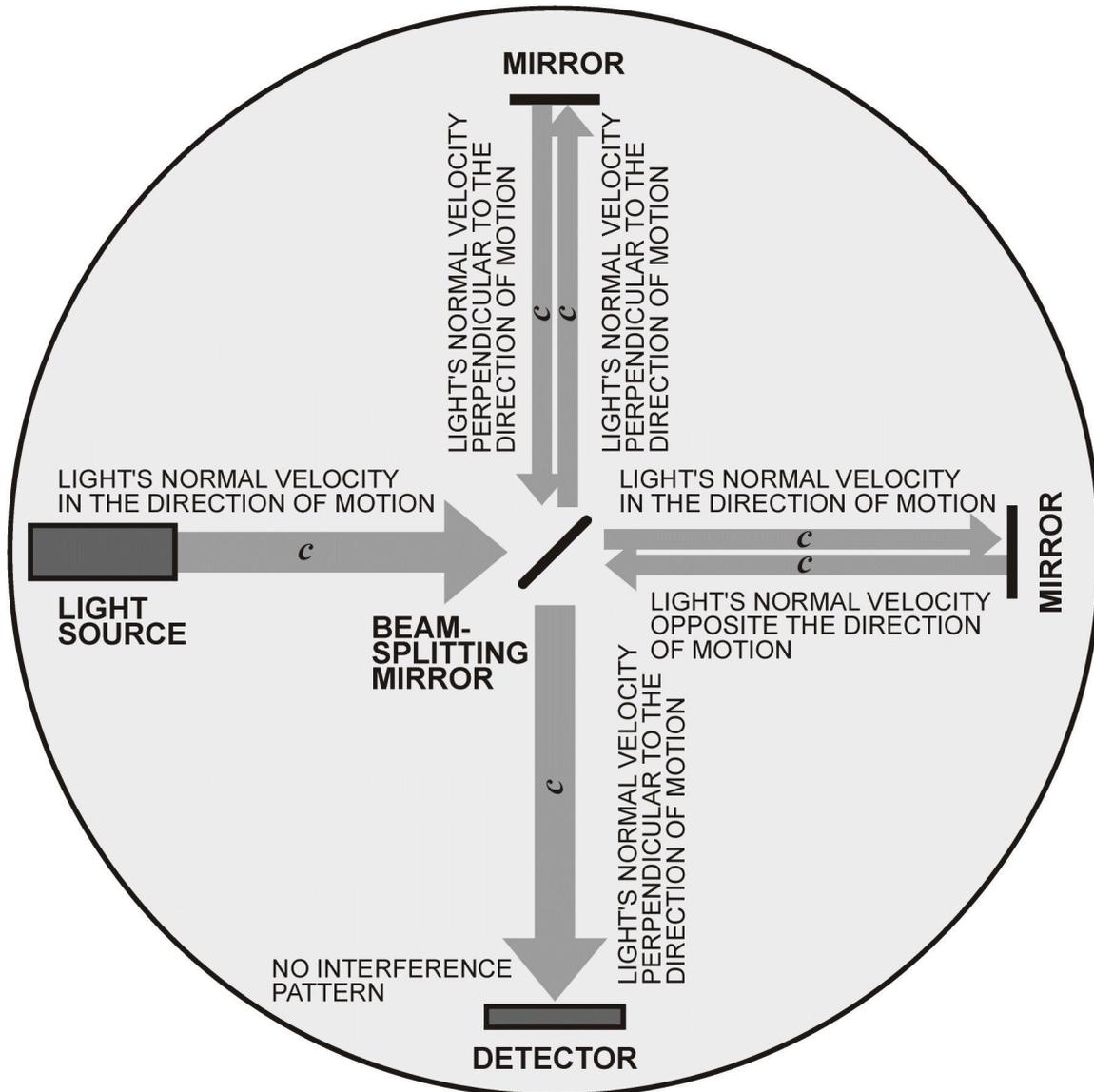
Figure 1



DIRECTION OF EARTH'S ROTATION & ORBITAL MOTION →

MICHELSON-MORLEY - CONCEPTUAL DIAGRAM
EXPECTED RESULT

The experiment essentially consisted of a light source projected onto a series of mirrors arranged perpendicular equal distances from a central beamsplitter mounted on a rotating table oriented with one beam projected in the direction of the Earth's orbital motion and the other perpendicular. When the light was recombined, it was expected to produce an interference pattern due to its decreased velocity from the theorized aether "headwind." This would confirm the aether's existence. But no interference pattern was found.

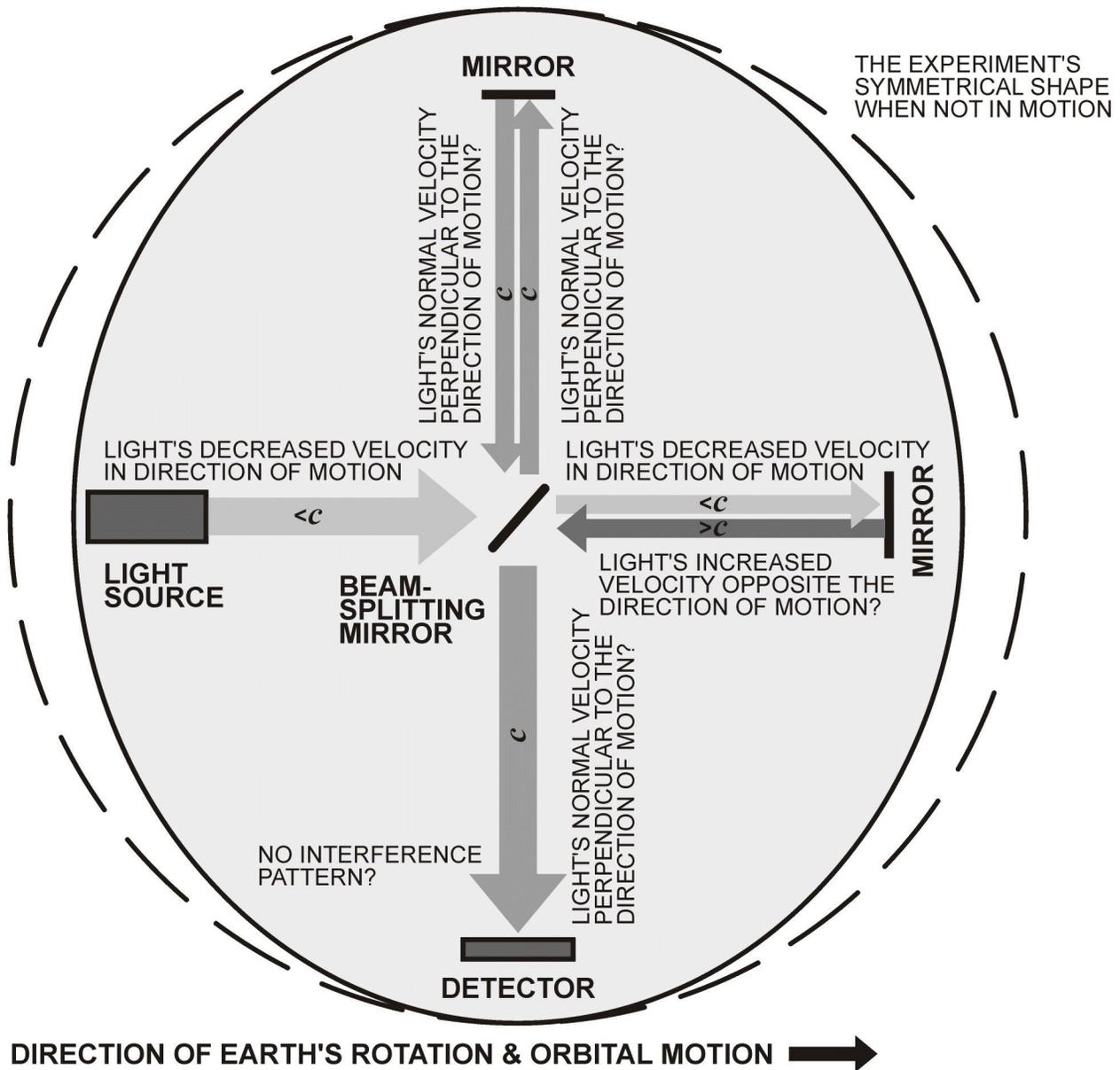


DIRECTION OF EARTH'S ROTATION & ORBITAL MOTION →

MICHELSON-MORLEY - CONCEPTUAL DIAGRAM ACTUAL RESULT

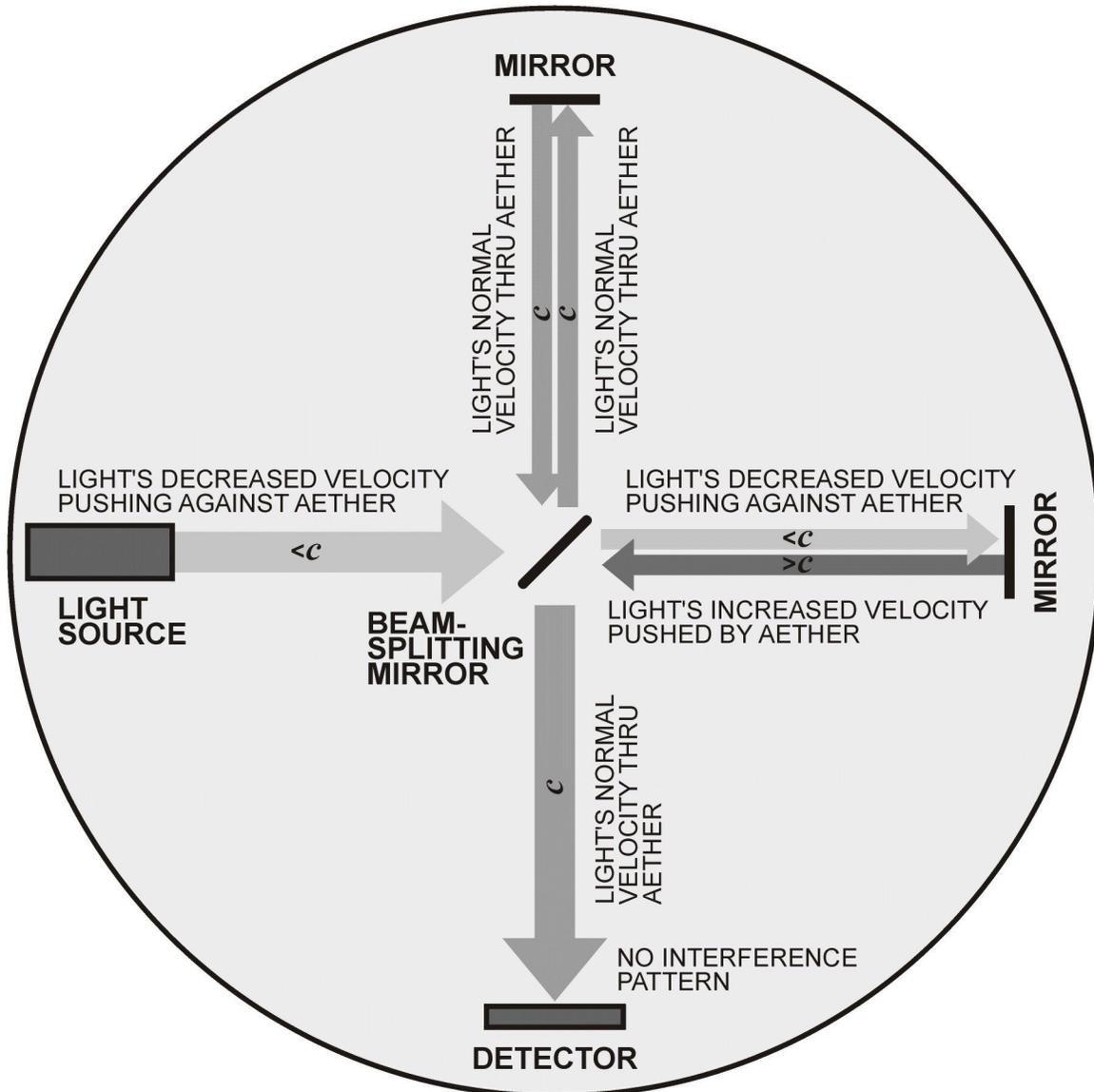
What the experiment actually showed is that light always leaves its source at 186,000mi/s in every direction at the same time as we'd naturally expect. This indicates its compounding with the motion of its source and implies its compounding with other reference frames. Which means that because everything's in motion, its velocity can never be fixed at 186,000mi/s but will always be some slower or faster rate that can be any velocity up to instantaneous.

If someone was out in space stationary with respect to the solar system, they'd be in a different reference frame recording a compounding of light's varying velocity, which is determined by the field density at their location, plus/minus the Earth's rotational and orbital velocity or some vector angle of it.



MICHELSON-MORLEY - CONCEPTUAL DIAGRAM
LORENTZ'S EXPLANATION ADOPTED BY EINSTEIN

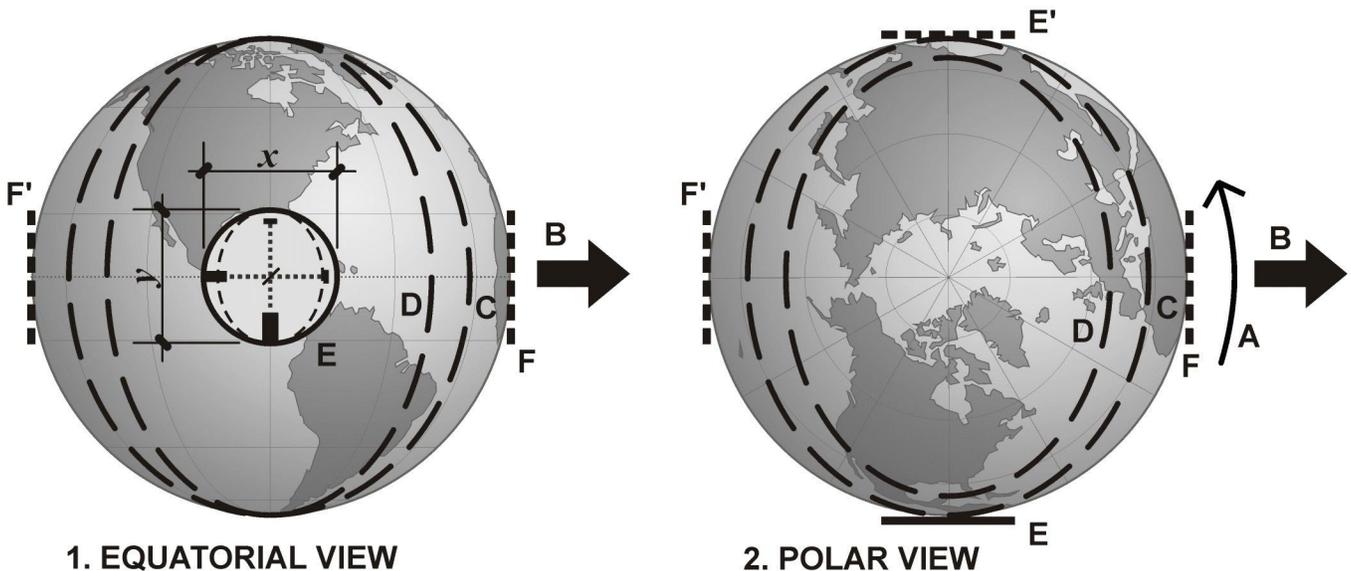
What Lorentz proposed to explain the result, and Einstein later adopted for relativity, was that objects contract in the direction of their motion while time slows to maintain light's fixed velocity so that an interference pattern is not produced. But what happens to the experiment for the reflected light moving opposite the direction of motion? To maintain light's constancy wouldn't it have to expand while time's rate increased? And how about in the perpendicular direction? Without any contraction wouldn't time's "slower" rate cause light's velocity to exceed 186,000mi/s? These irresolvable conflicts confirm that light's velocity cannot remain fixed in our real nontheoretical environment of three actual dimensions but must compound with motion, which invalidates any Lorentz contraction and undermines nearly all of relativity.



DIRECTION OF EARTH'S ROTATION & ORBITAL MOTION →

**MICHELSON-MORLEY - CONCEPTUAL DIAGRAM
AETHER EXPLANATION**

Instead of contriving the fantastic, self-conflicted notion that objects physically contract but only in the direction of motion while time's rate slows to maintain light's constancy, why wouldn't you simply reason that light's velocity is first slowed by the aether's "headwind" then is increased by the same amount from its "tailwind" after it's been reflected backward? It's not the correct explanation. But at least it's rational.



1. EQUATORIAL VIEW

2. POLAR VIEW

MICHELSON-MORLEY EXPERIMENT

The curved arrow at **A** indicates the direction of the Earth's rotation. The arrow at **B** gives the direction of the Earth's orbital motion. If motion causes the contraction of objects in the direction of motion and time's rate to slow to maintain light's fixed velocity, then in the direction of its orbital motion, the Earth would have to contract to an ellipsoid shape, as suggested by the dashed line at **C** exaggerated for clarity, but also contract to an ellipsoid shape because of its rotation, as shown by the dashed line at **D**. Note the difference between **C** and **D** in the polar view.

But Einstein asserts that the Earth only contracts in the direction of its orbital motion and its rotation can be ignored because it's a personal choice for each observer as to which objects are in motion with respect to one another. Meaning, from his point of view the Sun and the rest of the universe can be made to revolve around the Earth by anyone's subjective decisions, which would conflict with the subjective decisions of others. Of course, this is ludicrous. The Earth's rotation cannot be ignored.

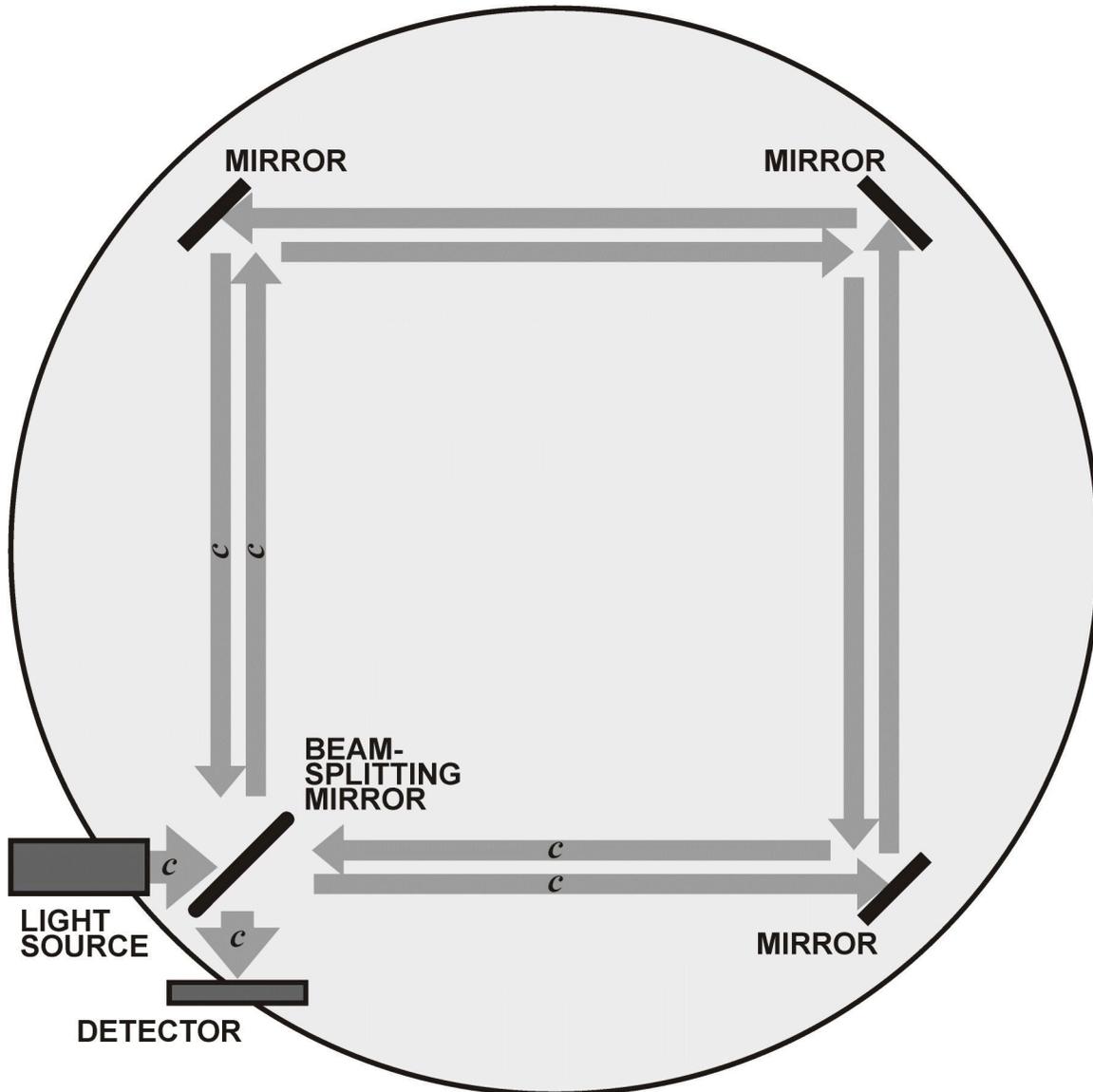
So let's assume that the Earth's rotation is an objective fact for everyone and that objects do contract in the direction of motion for all types of motion, including rotation, as Einstein also contradictorily insists. We can see that as the experiment, which essentially consisted of pairs of perpendicular mirrors arranged around a central beamsplitter, located at **E** at the equator for convenience, revolves around the Earth this would cause the distance between the mirrors in the x direction to contract, as implied by **E**'s dashed ellipsoid line as time's rate slowed. While in the y direction, the distance between the mirrors would remain constant. But being of the same reference frame, time's slower rate would have to apply to the light traveling in both directions. With contraction in one direction but not in the other, this should have produced a negative interference pattern. But it didn't.

For the Earth's contraction from its orbital motion, the distance between the mirrors in the y direction would also always remain constant. While the distance in the x direction would be constantly fluctuating as the Earth's rotation passed the experiment through its orbital tangents, **E** & **E'**, and perpendicular points, **F** & **F'**. This should have also produced an expanding and contracting negative interference pattern that peaked every twelve hours at its tangent points. But this didn't happen either.

If we were to exclude Einstein's assertion that the effects of special relativity cannot occur within gravitational fields because of light's variability, which already preemptively invalidates relativity by itself, this experiment shows that objects do not contract in the direction of motion nor does time slow with motion and that light continuously radiates in every direction from its source at a constant rate. This clearly demonstrates that light's velocity cannot be fixed but compounds with the motion of its source other reference frames. By refuting relativity's founding premise, nearly all of it is invalidated.

(16 MM 6a)

Figure 6



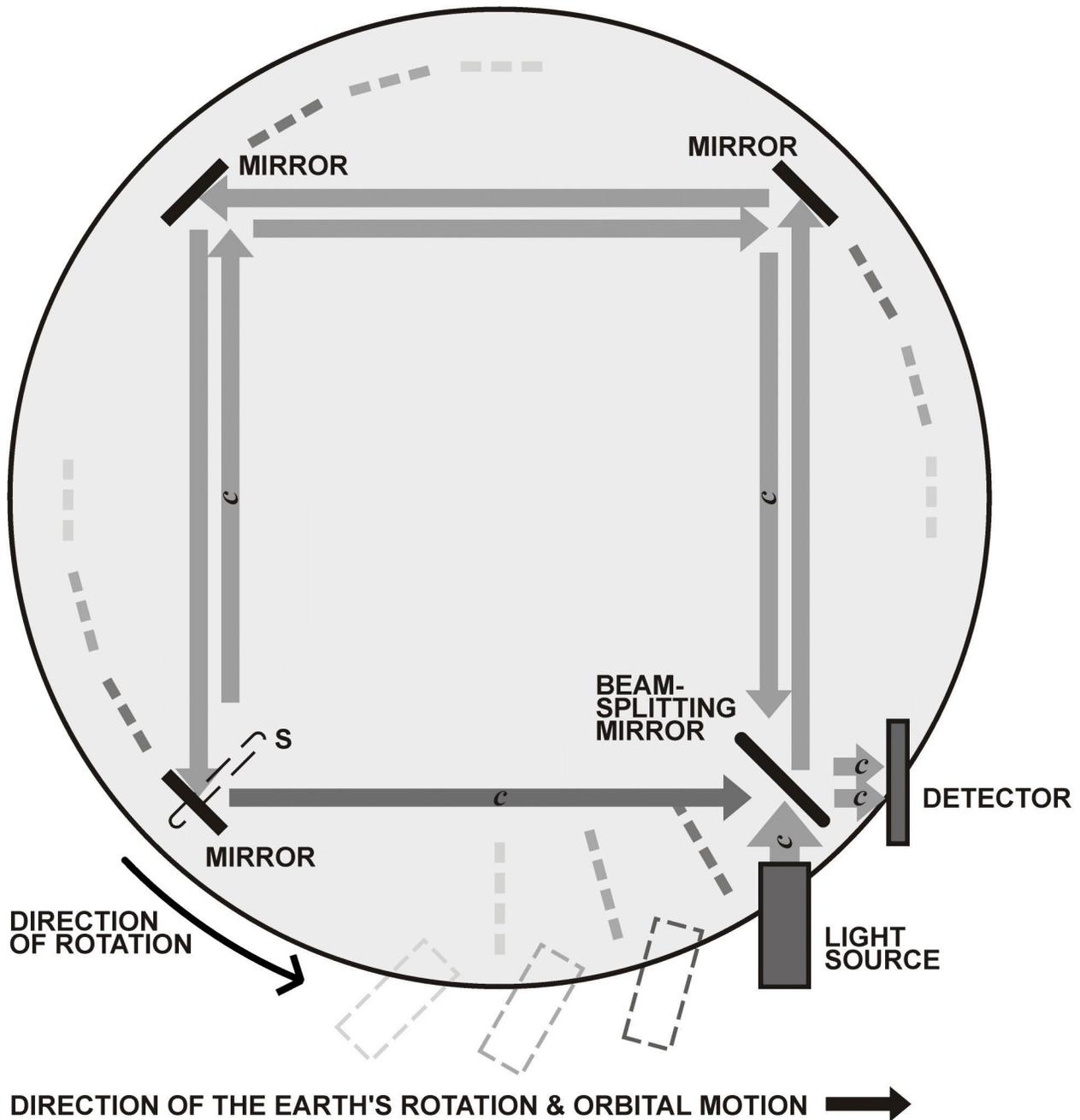
DIRECTION OF THE EARTH'S ROTATION & ORBITAL MOTION →

SAGNAC EFFECT - CONCEPTUAL DIAGRAM

NO ROTATION

Sagnac's experiment essentially consists of a source of light that's projected onto a beamsplitter that sends it in opposite directions around a series of mirrors arranged in a closed loop at the perimeter of a platform form that can be spun that recombines the beams back at a detector, as suggested by the grey linear arrows labeled as c that indicates light's velocity. The inside row of arrows indicates light's clockwise path. The outside counterclockwise.

When the platform is not rotating, no interference pattern is produced. This is essentially the same result as the Michelson-Morley experiment. Both show light always leaving its source at 186,000mi/s in all directions at the same time. Light's independent motion could qualify it as a separate reference frame. Because the platform and the light it's emitting move with all of the Earth's motions, rotational and orbital, our solar system's motion through our galaxy, and our galaxy's motion through the universe, this suggests light compounds with the motion of its source and that of other reference frames.



SAGNAC EFFECT - CONCEPTUAL DIAGRAM WITH ROTATION - ORTHODOXY

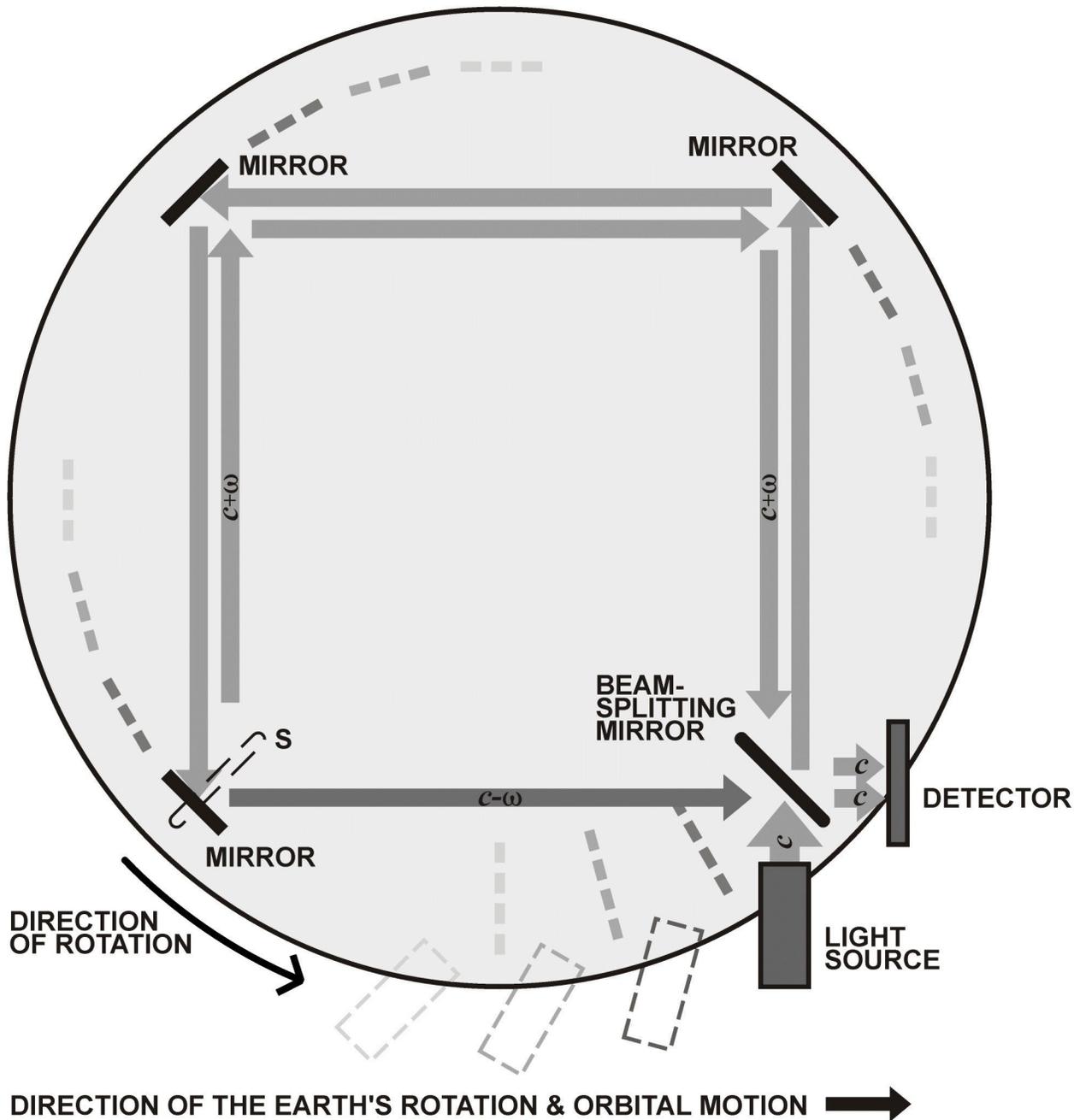
The interference pattern produced when the platform is spun has several possible interpretations. For convenience, let's establish the platform's rotation as constant with an angular velocity that completes one-quarter rotation for three-quarters of light's.

The conventional explanation assumes that the light still leaves its source at 186,000mi/s and is split from **S** at the same velocity in both directions. It's thought that because the platform is rotating into it, the rearward split light arrives at the detector first, which for our diagram is 3/4 of one revolution. While the forward split light arrives later, in 11/4 revolutions, the overlap indicated by the darker arrow. The difference in arrival times would produce a phase shift that creates an interference pattern.

Sounds reasonable enough, but it's inherently flawed. It fails to account for the platform's constant rotation. It departs from it at 186,000mi/s as if there were none.

(49.2 Sagnac Exp 5a)

Figure 8



**SAGNAC EFFECT - CONCEPTUAL DIAGRAM
WITH ROTATION - SPECIAL RELATIVITY**

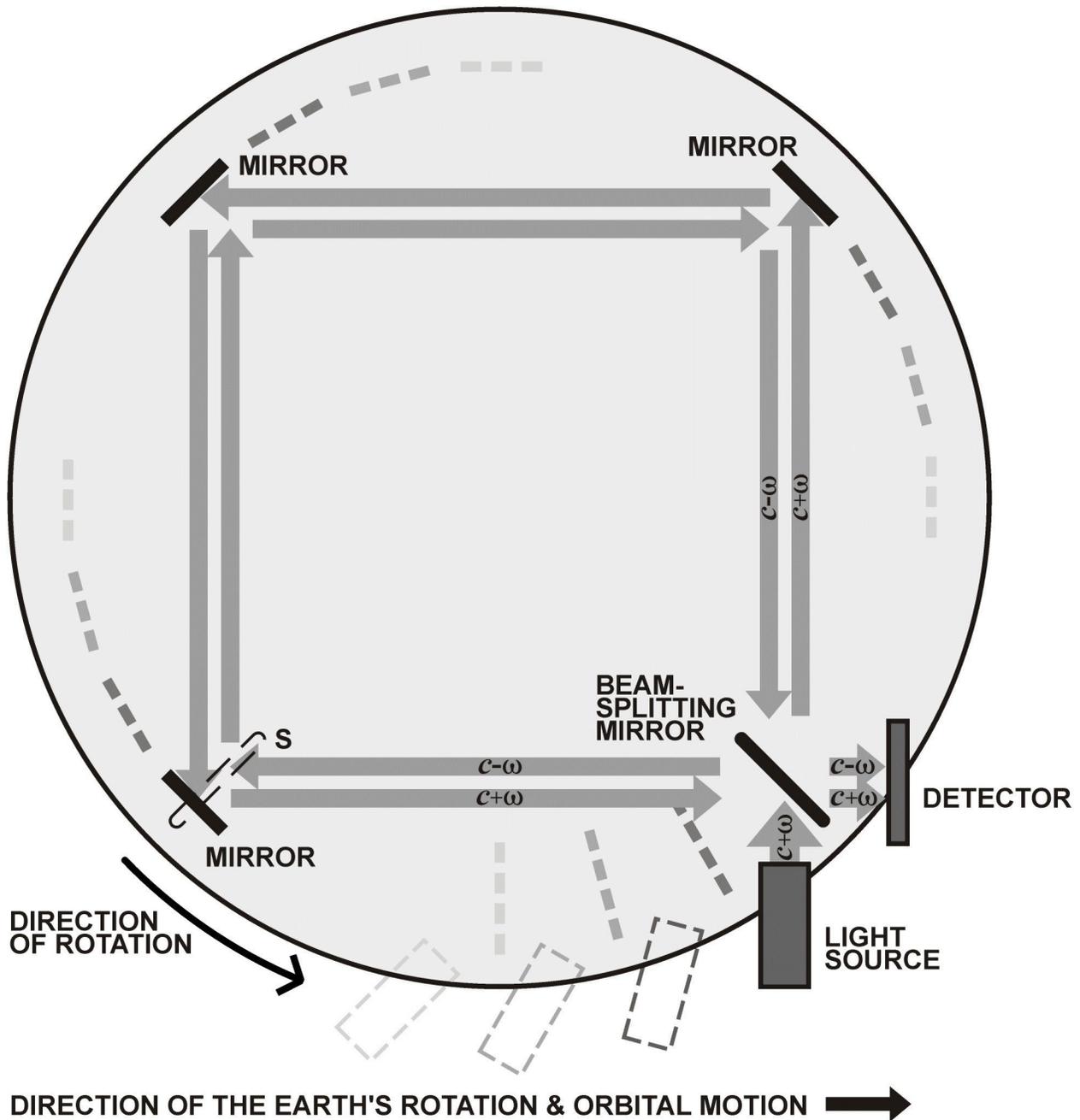
Special relativity does account for the platform's rotation. But it doesn't work either. The split light would leave at $c-\omega$ in the direction of rotation and $c+\omega$ opposite the direction of rotation to maintain light's fixed velocity. The light would arrive at the detector at different times because of the platform's rotation, creating an interference pattern.

But special relativity is inherently self-conflicted. It would have the platform's perimeter contracting while its radius remains constant and its time dilates for the entire platform. That's not even remotely feasible.

It would also conflict with the results when the platform is not rotating. It would have to be contracting in the direction of the Earth's motions to enforce light's constancy but not in the perpendicular direction while time's slowing would again have to be applied equally over the entire platform. It's one reference frame. So it fails in every respects.

(49.3 Sagnac Exp 5a)

Figure 9



SAGNAC EFFECT - CONCEPTUAL DIAGRAM WITH ROTATION - REALITY

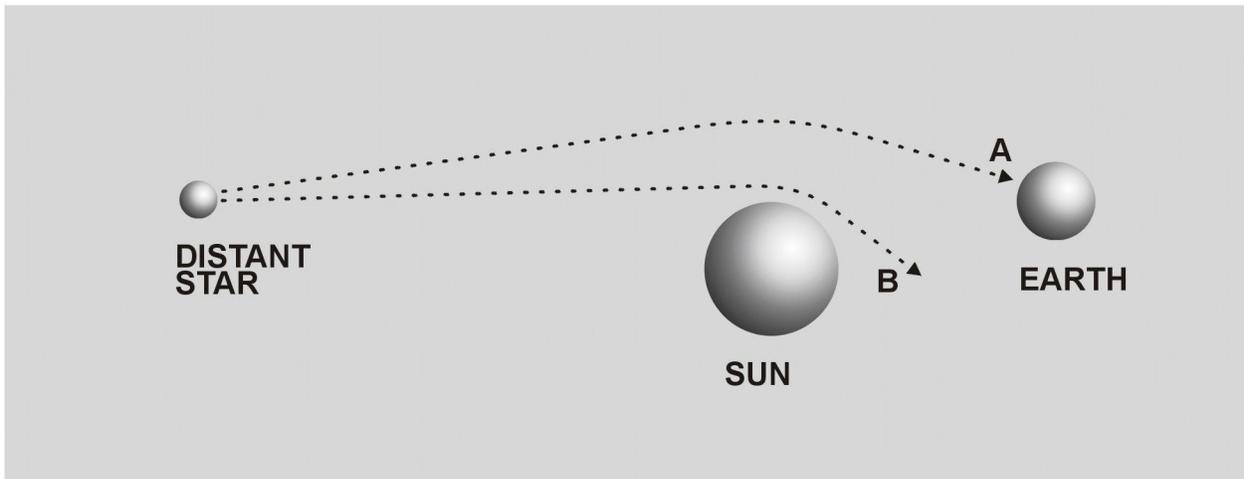
The only consistent way to explain the effect is if light compounds with the motion of other reference frames. It always leaves its source at 186,000mi/s in all directions at the same time. The non-rotating condition and Michelson-Morley clearly confirm that.

The platform's angular velocity, ω , (or some vector angle of it, which for this diagram would be a 45°, or .707) has to be imparted to the light. Its emitter is moving with it. So it has to be added/subtracted to light's velocity: $c + \omega$ for the forward split light and $c - \omega$ for the rearward split light. The result is that both beams reach the detector at the same time. But it's their different velocities that puts them out of phase and produces the interference pattern, not their different arrival times.

Sagnac's experiment unequivocally establishes light's compounding with the relative motion of other reference frames.

(49.4 Sagnac Exp 5a)

Figure 10

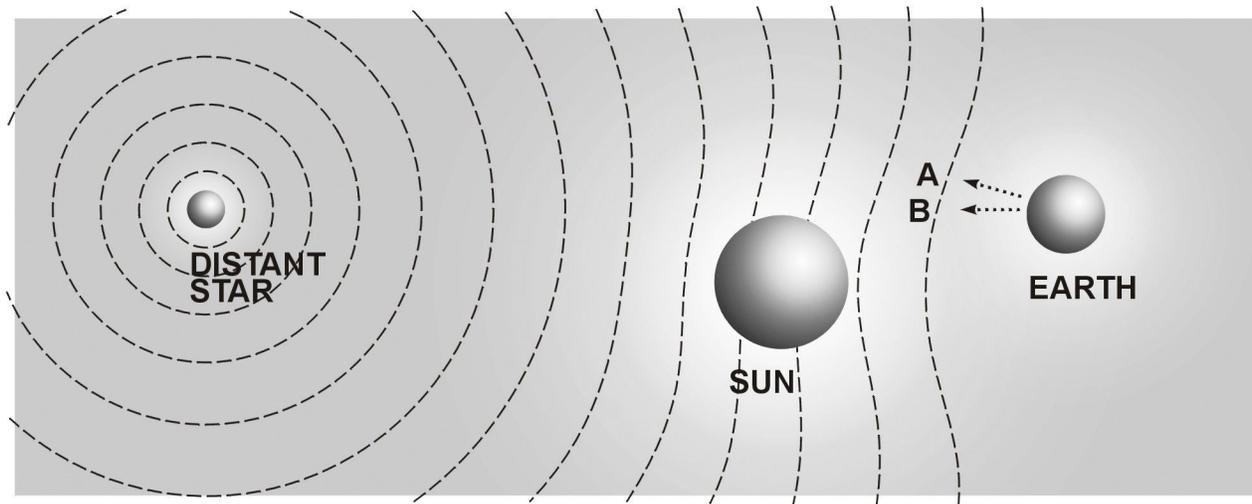


LIGHT'S BENDING

Our current belief is that a "ray" of light from a star or any distant object passing near a massive body like our sun is being pulled by gravity, that it's being bent from its otherwise straight path in the direction of **B** as it follows space's geodesic that somehow curves two-dimensionally in the vicinity of mass. And when viewed from Earth, its position is distorted in the direction of **A** due to an optical illusion.

Even though Einstein contends that light's distortion is actually due to its slowing through gravity fields, which is nothing more than refraction, which contradicts relativity's founding premise, light's fixed velocity, we reject his explanation. Instead, we hold to our belief that a photon, which remember is only a hypothetical quantum of massless energy, is subject to gravity's influence. We first mistakenly assumed that a photon is a particle. And then we incorrectly reason that because it's in motion it must have momentum. If it has momentum, it must have inertial mass. And then because of relativity's principle of equivalence, if it has inertial mass it must also have gravitational mass. And if it has gravitational mass, it must then be affected by gravity.

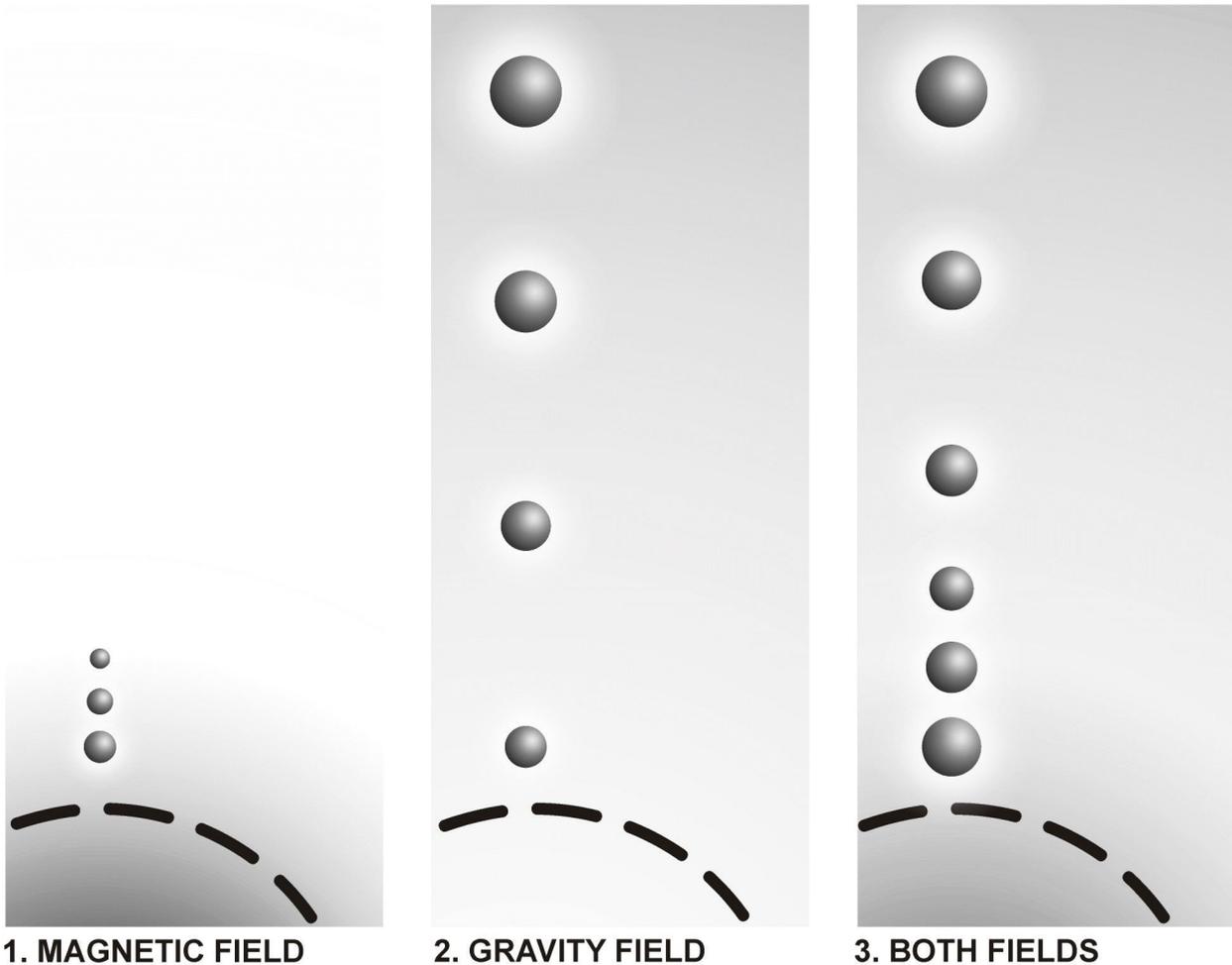
We're highly motivated to retain this convoluted logic because if we use light's refracted slowing like Einstein, we're abruptly confronted with the total collapse of relativity, which is wholly dependent on light's constancy. Incredibly, Einstein actually agrees that relativity would completely unravel if it were found that light's velocity was not fixed but variable.



LIGHT'S REFRACTION

Light refracts through gravity fields. The distant star appears displaced in the direction of **A** not because light rays follow the impossible curvature of two-dimensional space or a resultant optical illusion but because the light in that direction reaches us slightly before the light coming directly straight from the star in the direction of **B**. Light's velocity slows through the decreasing density of the Sun's gravitational field, depicted in section as the diffusing background, just as any wave travels slower through a less dense medium, as portrayed by the series of circular and wavy dashed lines that indicate the varying velocity of the incoming light emanating from the distant star.

It's also light's refracted slowing that's responsible for the gravitational lensing of distant galaxies or quasars that are split into two or more images that are assumed to be the product of the mass of some unseen foreground galaxy that's closer but fainter. But more often than not, it's just the common center of mass of any number of galaxies or galaxy clusters that is located between us and the object along its line of sight that's responsible for the lensing effect, which is why the refracting mass is so often never identified.



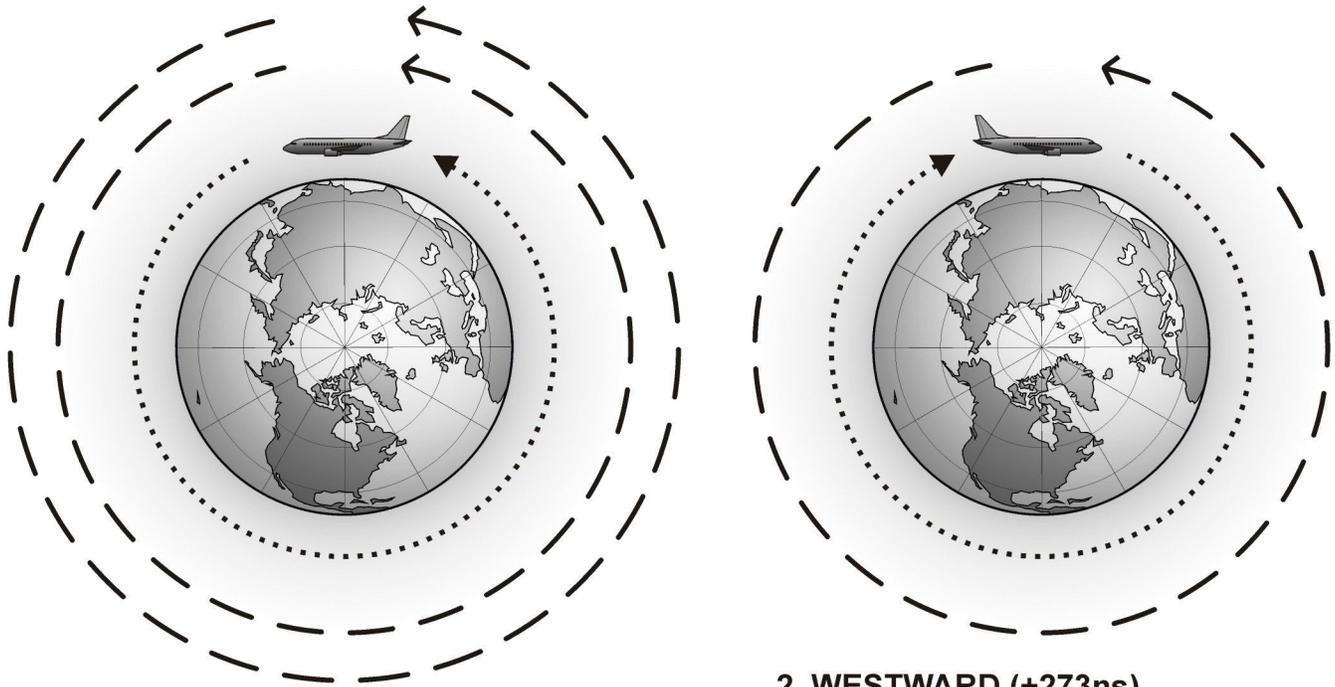
FIELD'S EFFECT ON SIZE

Subatomic particles are congealed out of the universal field of radiant energy. There are no particles per se, or the objects they compose. Ultimately, there are only condensed fields that are an inseparable extension of the infinitely continuous universal field from which they arose. So when its density decreases or increases like when it expresses as a magnetic or gravity field, the size of any nearby object in it has to vary correspondingly.

In diagram 1, imagine the Earth, omitted for clarity but where its surface is represented by the curving dashed line, without a gravity field but left with only its magnetic field. Its density dissipates from its center out exponentially, as depicted in section by the diffusing background. So all objects, including the cesium atoms of an atomic clock, would have to decrease in size correspondingly with altitude, as indicated by the sequence of spheres, which in turn causes their natural frequency to increase, making the clock run faster.

In diagram 2, now imagine the Earth without its magnetic field but left with only its gravity field. Its density increases with altitude exponentially. So any object, or again the cesium atoms of an atomic clock, would have to increase in size correspondingly as they move farther away, causing their natural frequency to decrease and the clock to run slower.

In 3, the compounded effect of both fields is portrayed. Objects first contract then slowly begin to enlarge as they move farther away. The gradient in the magnetic field is greater over a shorter distance because of its much smaller size while the gradient is much smaller for the gravity field because of its much larger size, which yields little change over the same distance. The sizes and effects suggested have been greatly exaggerated for clarity.



1. EASTWARD (-59ns)

THE CLOCKS' MOTION THROUGH OUR GRAVITATIONAL & MAGNETIC FIELDS DECREASED THEIR CESIUM ATOMS' NATURAL FREQUENCY MORE THAN THEIR ALTITUDE IN OUR MAGNETIC FIELD INCREASED IT

2. WESTWARD (+273ns)

THE CLOCKS' ALTITUDE IN OUR MAGNETIC FIELD INCREASED THEIR CESIUM ATOMS' NATURAL FREQUENCY MORE THAN THEIR MOTION THROUGH OUR GRAVITATIONAL & MAGNETIC FIELDS DECREASED IT

1971 HAFELE AND KEATING AIRBORNE CLOCK EXPERIMENT

There are practical commonsense explanations for the results of all those airborne clock experiments that don't rely on special relativity's self-conflicted, metaphysical effects, length's one-dimensional contraction that's bound to nonexistent time's three-dimensional dilation that impossibly enforces light's presumed constancy.

If we assume for convenience that the speed of the jet airliners carrying the clocks is roughly 500mph and about half the speed of the Earth's rotation, we can then see how when traveling in the eastward direction, with the Earth's rotation, the airliner would complete two revolutions in the time it takes to fly one. This would induce a charge to the clocks' cesium atoms from one revolution through the Earth's magnetic field and two revolutions through its gravitational field, which would increase the cesium atoms' size and mass that would slow their natural frequency, making their clocks run slower.

In the westward direction, the clocks' motion through our magnetic field would remain the same, one revolution. But because they're traveling in the opposite direction of the Earth's rotation, they're only traveling half the distance at half the speed through its gravitational field. So their cesium atoms' acquired charge would be much less than in the eastward direction, still slowing their clocks' rate, but not nearly as much.

When the effect is compounded with the increase in the cesium atoms' natural frequency due to the aircrafts' altitude in our magnetic field where the atoms contract because of the decrease in its density, coupled with only a very slight increase in density from our gravitational field, the eastward clocks end up with a greater mass and slower natural frequency that causes them to run slightly slower than the ground-based clocks.

Conversely, for the westward clocks, not having acquired nearly the same charge, the decrease in their cesium atoms' natural frequency is less than the increase resulting from their altitude. This leaves them with a higher natural frequency than the ground-based clocks that causes them to run faster. Any effect from our orbital motion through our Sun and galaxy's gravitational field can be excluded. It's essentially the same either way.

(6 Clocks 10a)

Figure 14