Why Morley Experiment Could Not Observe the Movement of Interference fringe

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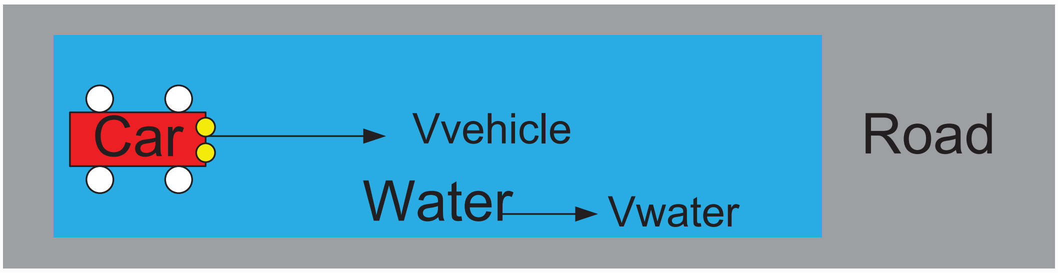
Abstract:

If the weakest gravitational wave could rise the fluctuation of the LIGO interference fringe of light, how should we neglect the gravity's influences on light? We raise the possibility that the light is affected by the gravity of the Earth. In this way, the Morley Experiment would not find the movement of interference fringe either in the air or in the vacuum environment.

I will make a detailed analysis in several parts:

- Impact of water on vehicle speed
- Impact of air on light propagation
- The influence of the gravitational field on the propagation of light
- Eddington observed the solar eclipse to verify general relativity
- Mass energy equation
- Fiber optic gyroscope
- Explanation of Sagnac effect
- Ask questions to special relativity

Let's first look at a scene as below:



A vehicle drives on the road being covering with water. Does it indicate that surface water is necessary for vehicle driving? I believe that everyone would give the answer "no", for vehicles would drive smoothly without surface water on road. Vehicle driving does not need water as the medium. In the contrary, water would affect the driving speed of vehicle. The driving speed of vehicle is assumed as V water. When V water=0, that is, the water is static against the ground, and the driving speed of vehicle against ground is V vehicle, then the driving speed of vehicle parallel to the flow direction is V vehicle + V water and the driving speed of vehicle in reverse against the flow direction is V vehicle - V water. Water flow affects the vehicle speed and the vehicle is seized by water.

If the direction of V water is not in parallel with V vehicle, then we only need to break V water into the velocity component Vx in parallel with the V vehicle direction and the velocity component Vy in reverse against the V vehicle direction. The logic is the same. For simplicity, let's assume that V vehicle is in parallel with V water to make illustration.

There are two buoys of A and B on the water surface and the distance between A and B is L. They are static against water surface. The direction of water flow is from A to B. Now the vehicle needs to drive from A to B and then from B to A. We need to measure the duration time T.

First, let's check the duration from A to B. the vehicle drives parallel to the water, with the speed being V vehicle + V water. As the buoy is static against water surface, it also moves along the same direction with the speed V water. Therefore, it takes the time of L/(V vehicle + V water – V water） = L/V vehicle.

Then, it comes to B to A. The vehicle drives against water, with the speed being V vehicle – V water. As the buoy is static against water surface, it also moves in the reverse direction with the speed V water. Therefore, it takes the time of L/(V vehicle - V water + V water） = L/V vehicle.

We can find that the duration from A to B and equals that from B to A. Such a duration has nothing to do with the V water, the speed of water against ground. This conclusion is also valid even if the direction of V water is not in parallel with that of the V vehicle.

If we take the water as the reference object to measure the speed of vehicle, speed = distance / time = L/ (L / V vehicle) = V vehicle. It can be regarded as that people in the vehicle driving in a constant speed measure the speed of toy vehicle. The measured speed of toy vehicle remains the same no matter what is the driving direction. However, if it takes the ground as the reference object, the speed of toy vehicle would vary with the moving direction. That is, speed would be different if the reference system is different.

The analysis above is made for the sake for light analysis. A beam of light transmits in the air. Does it indicate that air is necessary for light? The answer is no. The transmission of light does not need the medium of air. In the same way, the existence of air would affect the velocity of light transmission. The velocity of light moving parallel to the air is faster than that of light moving in reverse against the air. Light is seized by air.

Let's compare the two scenarios above:

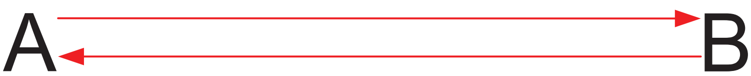
Vehicle……counterpart……light

Water……counterpart……air

Road……counterpart……space

Water moves against road……counterpart……air moves against space

Now let's focus on light: (The velocity of light in the vacuum is C. It assumes that the air and ground are relatively static. For simplicity, let's set the direct of light and the revolution speed of the Earth is V Earth. In the short period, we could regard the movement of the Earth as the uniform linear motion.

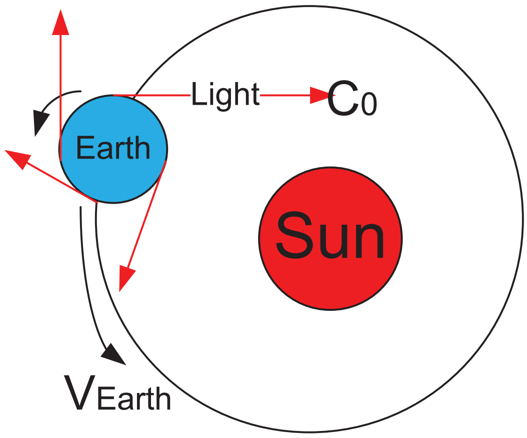


Let's place two signs of A and B on the ground. The direction from A to B is in line with the direction of the Earth speed V Earth. When the ground is static against point O in the space, the speed of light in the air is C0. Then when the light moves from A to B, the required time is L/(C0+V Earth -V Earth)=L/C0. When the light moves from B to A, the required time is L/(C0-V Earth + V Earth)=L/C0. Therefore, no matter what is the speed of the ground against point O in the space, it would not affect the duration that light moves A to B or from B to A. In a similar way, if the water surface is taken as the reference object, the vehicle speed would not change no matter what is the driving direction; the light takes the Earth as the reference and its speed would not change. Can we say that the existence of air is the fundamental reason for the phenomenon that Morley could not observe the movement of interference fringe of light? ***NO!***

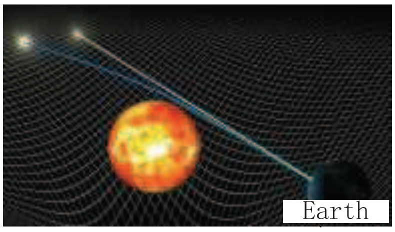
The LIGO interferometer of the United States improves Morley Experiment. It places the experiment completely in the vacuum environment and the light would not be affected by the air any more. If the cause for the failure of Morley Experiment lies in air, LIGO should observe the movement of fringe, but it did not.

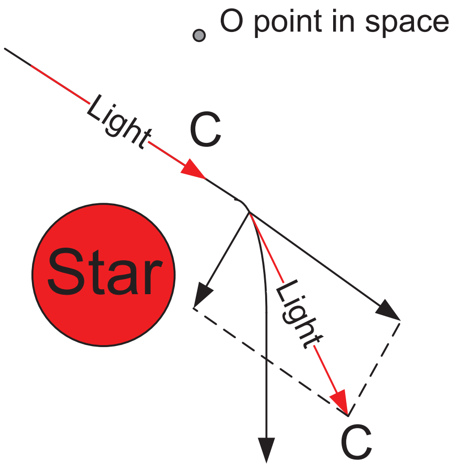
In accordance with our deduction just now, the duration for light moving from A to B should be L/(C-V earth) and that from B to A should be L/(C + V earth) by the classical physics, which shows that the required duration varies with V earth. Then it should be easy to find the fluctuation of fringe, but we could not. Does it further demonstrate the theory of Einstein that light speed would be constant no matter in which inertial reference system? Or is there other possibility? The greatest finding of LIGO is the discovery of gravitational wave. The weakest gravitational wave rises the fluctuation of interference fringe, that is, the gravitational wave affects light speed and leads to the changes of LIGO optical path difference in the horizontal direction and vertical direction. This finding is significant, which demonstrates that gravitational wave could affect light transmission.

If the weakest gravitational wave could rise the fluctuation of the LIGO interference fringe of light, how should we neglect the gravity's influences on light? We raise the possibility that the light is affected by both the gravity and the air in the Earth. In this way, the Morley Experiment would not find the movement of interference fringe either in the air or in the vacuum environment. The vehicle is seized by the water flow. When the water surface serves as the reference object, the vehicle speed is constant; light is seized by gravity. When the ground serves as the reference object, the light speed is constant. When the ground serves as the reference object, the vehicle speed varies and the speed of water flow would be added. Is the light speed viable when the point O in space serves as the reference object? Would the movement speed of gravitational field of the Earth be added?



Eddington observed solar eclipse to verify general relativity. Such an observation demonstrates the correctness of general relativity and also proves that the light speed is affected by gravity as the light speed varies. Under the influence of gravity, the velocity component of light decreases in the original direction and that increases in the gravity direction. We could not measure whether there is any change of C' near fixed star, but only find the changes of light direction. However, as light moves away from the fixed star, the measured light speed is still C. is it like the sound wave in the air? The sound speed in the plane would add with the speed of plane. However, when the sound travels out of the plane window, the sound speed returns to the speed in the air which is static against the ground. They are similar with each other. The difference between them is that light is pulled by gravity, while sound waves are pulled by aircraft because of the medium (air inside the aircraft).

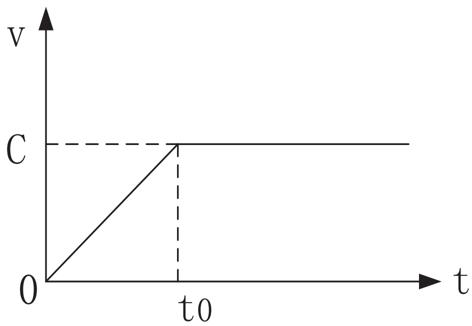




Is the light speed really constant? Could Morley Experiment lead to the conclusion that light speed is constant under any inertial reference system?

The mass energy equation **(E=m*c*c)** does not need relativity as the basis. Using classical Newtonian mechanics to derive the mass energy equation.

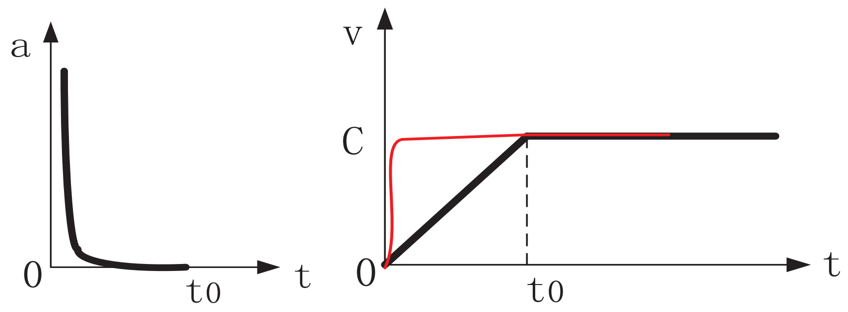
1. It is assumed that it takes time t0 for a substance with mass m to accelerate from v=0 to v=C, and then it is assumed that this process is a process of uniform acceleration.



The displacement S=C*t0/2

W=F*S=m*a*S=m*a*C*t0/2=m*C*a*t0/2 =m*C*C/2

2. But in fact, it's not accelerating evenly, but like this:

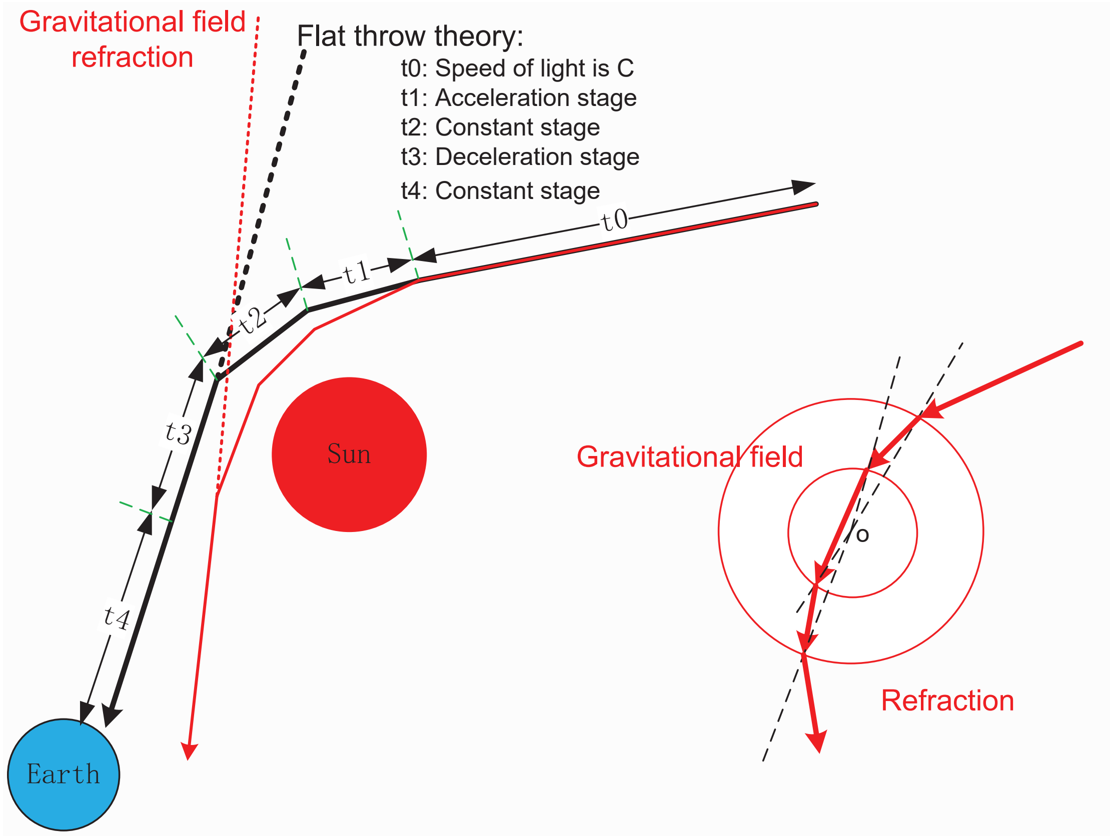


3. The displacement can be approximately s = C * t0.
4. The acceleration is nonlinear, which is a function of time t.
   W=F*S = m*a(t)*S=m*a(t)*C*t0=m*C*a(t)*t0
5. The cumulative effect of acceleration on time is the final velocity C, a(t) * t0 = C.
6. Therefore:W=F*S = m*C*a(t)*t0 = m*C*C.

Science is rigorous. It is based on the logical analysis and mathematical derivation of scientific experiments. We use the classical Newtonian physics theory to analyze the Morley experiment and derive the mass energy equation. We don't need the assumption that the speed of light is constant, and we have proved that the assumption is wrong.

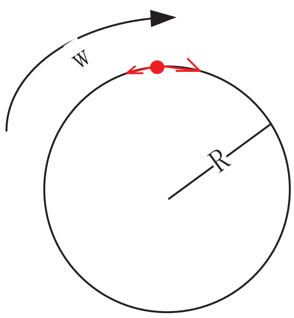
Now let's analyze Eddington observation.

There are two reasons that can lead to the bending of the object's moving path, one is the effect of the force, resulting in the speed in the vertical direction, the other is the refraction caused by the inhomogeneous medium or field, resulting in the bending of the path. Then the bending of light is probably caused by the latter. The sun is surrounded by a circle of gravitational field, the stronger the gravitational field is. When the light passes through the gravitational field of the sun, the light bends like refraction due to the inhomogeneity of the gravitational field. The bending of this path is different from the bending caused by the direct action of gravity. So it is not suitable to calculate the bending angle of light with the classical theory of flat throw.



In this paper, we have analyzed that no matter sun moves in the same or opposite direction or at a certain angle, the speed of light relative to sun will not change. In the calculation of the theory of flat throw, because there is an acceleration process under the pull of gravity at the beginning, before the acceleration caused by gravity becomes negative, the light will be more far away from the sun, less affected by gravity, so the deflection angle of light will be smaller. This is the reason why the deflection angle of light calculated by the classical theory of flat throw is too small. There is nothing wrong with Newtonian mechanics, but it was not used correctly that time.

Explanation Of Sagnac Effect:



Fiber optic gyroscope has been widely used, and its working principle can be well explained by classical Newtonian mechanics. The speed of the fiber optic gyroscope relative to the ring is as follows: assuming that the speed of light in the ring is C0 when the fiber optic ring is stationary.

The radius of the ring is R, and the angular rate of the ring is w.

Speed of light along the ring: V1 = C0 - w*R (1)

Speed of light against the ring: V2 = C0 + w*R (2)

So the time difference when the light emitted from the two directions meets:

delta t = 2Pi * R / V1 - 2Pi * R / V2, substitute formula (1), (2) for finishing, delta t is about equal to: 4Pi * R *R * w / (C0 * C0).

The optical path difference is delta S = C0 * delta t = 4Pi * R * R * w / C0.

The number of corresponding fringe movement is:

num = delta S / optical wavelength = 4Pi * R * R * w / (C0 * wavelength).

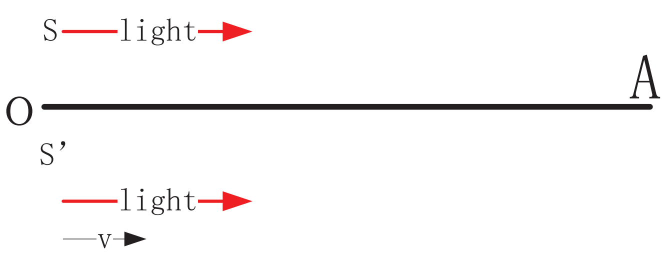
By the number of stripes moving, we can calculate the rate of w.

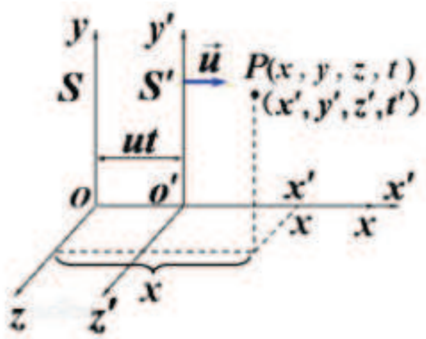
For instance:

Assuming that the number of moving stripes is 1, R = 1m, and the wavelength of light is 500nm, then w = num * C0 * wavelength / 4Pi * R * R = 11.9 radians per second. The calculated results are in good agreement with the measured results. But if you look at the formula (1) and (2) here, they are directly against the constant speed of light. Is it a coincidence that they are wrong? Fiber optic gyroscope has been widely used, which is enough to show its correctness.

Can the rotation of the earth be measured when the fiber optic gyroscope is stationary relative to the ground? According to our previous analysis, it is impossible to measure the rotation of the earth, because light is held by a gravitational field. This has also been confirmed with the engineers who produce fiber optic gyroscopes.

Ask special relativity:





As shown in the figure above, the light source S is stationary, and S' moves at the speed V relative to the O point. According to Lorentz transformation and the mainstream special relativity, they shoot light at the target A point at the same time.The distance from O to A is L.

In the S reference system, the time of arrival of the light emitted by S:

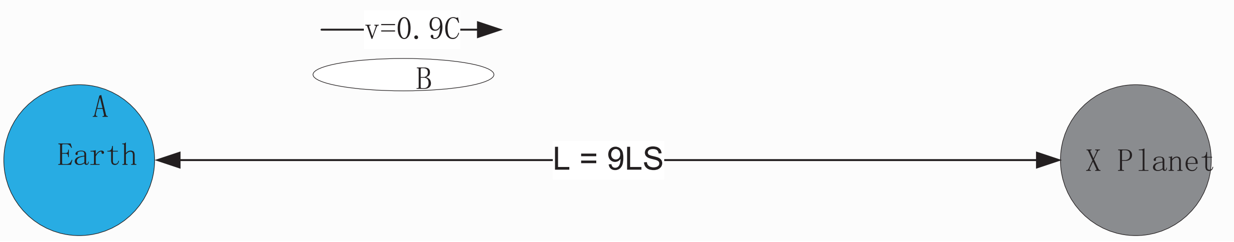
t = L / C

In the S' reference system, the time of arrival of the light emitted by S':

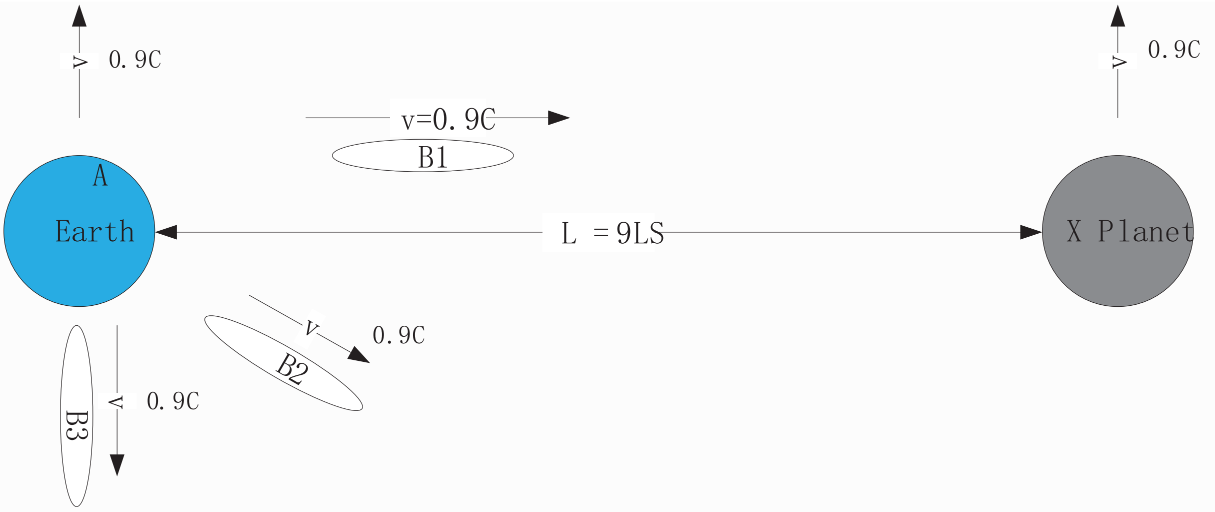
$$t' = t\frac{1}{\sqrt{1-\frac{v^2}{c^2}}}$$

It can be seen that t' is expanding, which means that we often see that time is slowing down. For example :The time on S' has passed one second, and the time on S has passed more seconds. This is the conclusion of special relativity.

Let's continue to look at the following scenario according to the mainstream special relativity.



B flies to Planet X at a speed of 0.9c relative to A on Earth. In A's opinion, it takes L / C = 10 seconds for B to reach Planet X. According to the special theory of relativity, the elapsed time of B is 10 seconds * sqrt (1-V * V / C * C) = 4.35 seconds. Now let's make this story a little more interesting. Let the Earth and Planet X move at the same speed, and the direction of speed is perpendicular to their line, and let some ships fly from earth in different directions at .9c relative to Earth.



Questions:

1. Is B1 still reaching Planet X after 4.35 seconds?
2. If the Earth passes for 10 seconds.
    a. How many seconds have passed on spaceship B1?
    b. How many seconds have passed on spaceship B3?
    c. How many seconds have passed on spaceship B2?

These questions, I believe, cannot be explained by special relativity, but they are very simple from the perspective of classical Newton theory.

If the weakest gravitational wave could rise the fluctuation of the LIGO interference fringe of light, how should we neglect the gravity's influences on light?

If light is held by gravity, then measuring the speed of light anywhere on the earth will be a constant.

If classical physics can explain the Morley experiment, it can explain the bending of light, and it can deduce the mass energy equation. So is it necessary to assume that the speed of light is constant.