Absolute Motion, Light Speed Limit, Superluminal Galaxies and Star Light Bending

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Abstract

In this paper we assert that *absolute motion* is not motion relative to the hypothetical *ether*. Absolute motion is fundamentally motion of a body relative to all matter in the universe. Hence absolute motion does exist but the ether doesn't exist. The ether has been disproved by the Michelson-Morley experiment and the Arago and the Airy star light refraction and aberration experiments. On the other hand, absolute motion has been detected in the Silvertooth, the CMBR anisotropy, the Marinov, the Roland De Witte and other experiments. We show how this view of absolute motion can also be compatible with the observed phenomena of light speed limit, superluminal galaxies. We show that star light deflection near the Sun doesn't exist.

Introduction

Absolute motion has been universally thought as motion relative to the hypothetical light carrying medium, the ether. This has been the view among supporters and opponents of the ether alike. This misconception of absolute motion has led physics the wrong path for over a century.

The Michelson-Morley experiment was conceived with this wrong conception of absolute motion. Scientists had a simplistic, wrong understanding of absolute motion that it is motion relative to the ether and when they failed to detect the ether they concluded that absolute motion didn't exist. Nevertheless, the Michelson-Morley experiment is rightly considered as one of the great scientific experiments ever performed because it disproved the ether experimentally and decisively. What was wrong was not the experiment itself, but the path followed by physics as a consequence of the "null" result of the experiment.

The ether hypothesis should have been subjected to a thorough conceptual test even before doing a physical experiment. If this had been done, the null result of the experiment would not have been a big surprise as to lead physicists to resort to exotic, illogical, inconsistent ideas such as time dilation. The lesson to be learned from the Michelson-Morley experiment is that the experimenter should make thorough theoretical and psychological preparations before carrying out the experiment, however long it takes. Perhaps, it can be better not to do an experiment than to do it without sufficient preparation.

No one could conceive of what the ether was other than as a light transmitting medium. Scientists had already identified many conceptual problems with the ether hypothesis. Here I propose a simple problem. If the ether existed freely everywhere, including inside material objects, then one would be able to see even through opaque objects because light itself would be nothing but a wave on the ether. Saying that the ether freely flows through all physical objects is equivalent to saying that light is transmitted through all objects. I wonder what supporters of ether theory have to say about this.

These conceptual problems with the ether hypothesis, in combination with the null results of experiments, however, led not only to abandonment of the ether but also to rejection of absolute motion and absolute motion effects. This was because the concepts of ether and absolute motion were and still are synonymous. But absolute motion has been unambiguously detected in several experiments such as the Silvertooth, the NASA CMBR anisotropy, the Marinov, the Roland De Witte experiments and other experiments. The Michelson-Morley experiment (MMX) disproved the ether, not absolute motion. The MMX disproved unentrained ether, whereas the relatively recent Silvertooth experiment has disproved entrained (dragged) ether.

The question then is: if absolute motion exists and if it is not motion relative to the ether, then what is absolute motion relative to ?

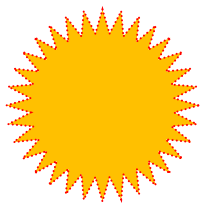
What is absolute motion ?

If absolute motion exists as clearly proved by several experiments and if we reject the ether, then we are naturally left with only one idea: *absolute motion of an object is basically motion of the object relative to all physical massive bodies in the universe*. Fundamentally, all that exists is relative motion between bodies and there is no motion relative to independently existing space. This is somewhat similar to Mach's idea of inertia. Traditionally, this same argument misled the physicists to the principle of relativity that absolute motion doesn't exist.

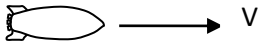
Now let us speculate on how to formulate this idea.

Absolute velocity of an object is the resultant of its weighed velocities relative to all massive bodies in the universe.

Let us start with a simple case of two physical bodies A and B. Let B be much smaller than A. Let A be the Sun and B be a space craft. Assume that the Sun and the spacecraft are the only bodies in the universe.



A



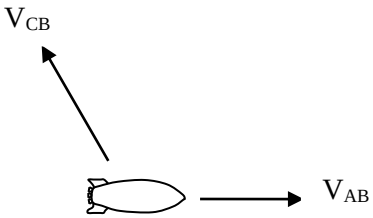
B

The argument we make in this paper is that since the mass of the Sun is 2 x 10^{30} Kg compared to space craft mass of about 2000 Kg , the velocity of the spacecraft relative to the Sun is also the absolute velocity of the spacecraft. This means that the massive Sun creates absolute space in its vicinity. The spacecraft moves relative to the space defined by the Sun. In this case the Sun is at absolute rest since it is much more massive than the spacecraft. A device fixed to the spacecraft that can detect absolute motion such as the Silvertooth experiment can detect the absolute velocity of the spacecraft.

It is natural to assume that the effect of the Sun will diminish with distance from the Sun. This means that for the same velocity of the spacecraft relative to the Sun, the absolute velocity of the spacecraft will diminish with distance from the Sun.

Now let us assume that there is also another body, say planet Earth, in the universe in addition to the Sun and the spacecraft.

A



B

C

V_{AB} is the velocity of the Sun relative to the spacecraft and V_{CB} is the velocity of the Earth relative to the spacecraft. R_A is the distance of the Sun from the spacecraft and R_B is the distance of the spacecraft from the Earth.

We propose that the absolute velocity of the spacecraft is the resultant of weighed velocities of the spacecraft relative to the Sun and relative to the Earth.

$$\overrightarrow{\boldsymbol{V_{abs}}} = \frac{M_A}{M_A + M_B + M_C}\ f\ (R_A)\ \overrightarrow{\boldsymbol{V_{BA}}}\ \ +\ \ \frac{M_C}{M_A + M_B + M_C}\ f\ (R_C)\ \overrightarrow{\boldsymbol{V_{BC}}}$$

Since the mass of the Sun is many orders of magnitude greater than the mass of the Earth (5.97×10^{24} kg), the absolute velocity of the spacecraft will be determined almost exclusively by the velocity of the spacecraft relative to the Sun. However, when the spacecraft is flying in the vicinity of the Earth, the velocity of the spacecraft relative to the Earth will significantly determine the absolute velocity of the spacecraft. The function *f (r)* is yet to be specified. We speculate here that *f (r)* can take the following form.

$$f(r) = e^{-k\,r}$$

where *k* is some constant. One requirement is that

$$f(r) \approx 1 \quad , \quad for\ r \approx 0$$

In the real universe the absolute velocity of the spacecraft is the weighed velocity of the spacecraft relative to the hundreds of billions of galaxies. As discussed above, therefore, the absolute velocity of the spacecraft is determined by nearby galaxies and distant galaxies will have less effect. An important question is whether the function *f(r)* should diminish rapidly enough with distance.

What is the consequence of this ?

Light speed limit and superluminal galaxies

The light speed limit has already been demonstrated in the laboratory for electrons. I have proposed in my previous paper [2] that the light speed limit applies not only to charged particles but also to all physical objects with mass.

One of the problems to relativistic physics today is the observation of superluminal galaxies. Now the theory proposed above can explain both the light speed limit and superluminal galaxies.

In my previous paper [2] I have proposed that the light speed limit applies to *absolute* velocities of physical bodies. That is, the absolute velocity of a physical object with finite mass can never reach or exceed the speed of light.

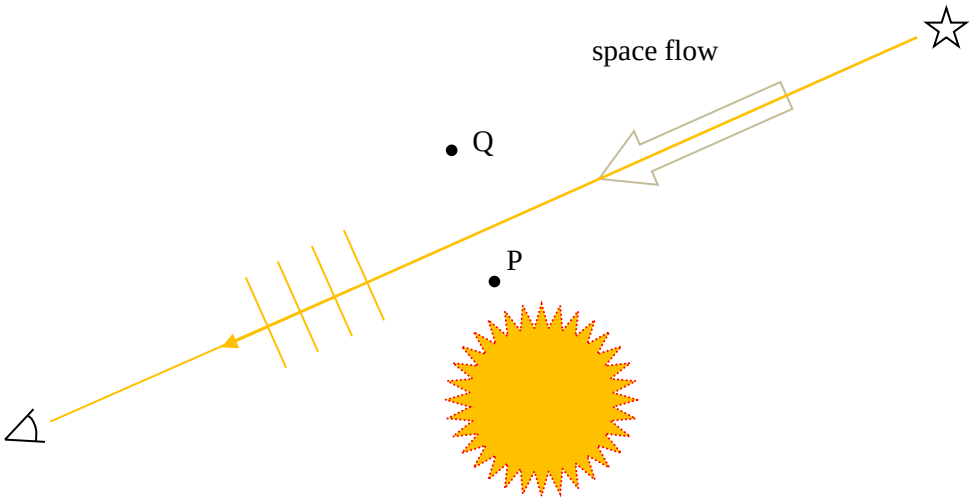
From our discussion above, we have argued that absolute space is determined by massive nearby bodies (galaxies, stars). This means that distant galaxies will not have significant effect on absolute space here. This means that an object at absolute rest here can be in motion relative to an object at absolute rest billions of light years away. In other words absolute space is local. The Solar System's absolute space can be moving relative to a distant absolute space.

Therefore, superluminal galaxies observed from the Earth have superluminal velocity relative to us. In the absolute space in which they are moving, their absolute velocity is always less than the speed of light. Thus we have reconciled the phenomenon of light speed limit and superluminal galaxies.

Bending of star light near the Sun

What about starlight bending in the vicinity of the Sun ?

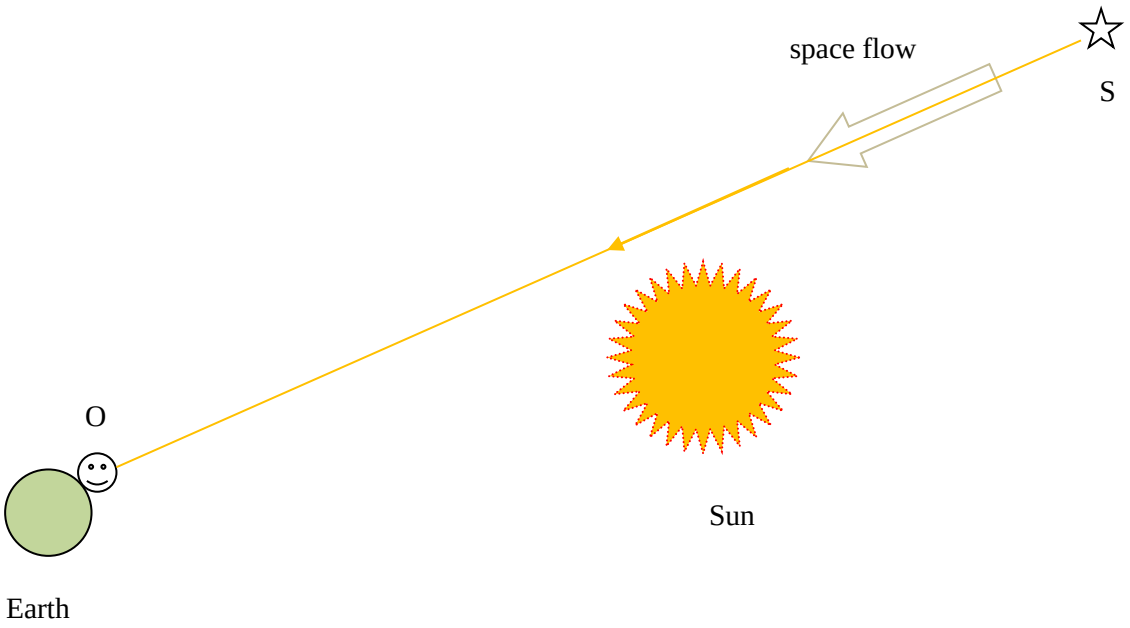
Consider two points P and Q in the vicinity of the Sun. Point P is closer to the Sun than point Q.



Our previous hypothesis was that absolute space is space in the vicinity of massive cosmic bodies. However, since the Sun is not the only massive cosmic body in the universe, it will not completely 'fix' the space in its vicinity as in our previous hypothetical case of the Sun and the spacecraft. However, the Sun, in its vicinity, will reduce the flow of space. This means that the Sun will drag the space in its vicinity to some (small) extent. The space at point Q will flow slightly faster than the space at point P. However, the new theory is distinct from ether theory and general relativity in that there will be no bending of light in the vicinity of the Sun despite

the fact that space is flowing slightly slowly at point P than at point Q. The absence of light deflection is connected to the constancy of the *phase velocity* of light irrespective of observer's velocity (flowing space) proposed in my paper [2].

However, the modification of space flow in the vicinity of the Sun will affect the group velocity of light. The extreme subtlety of the speed of light [2], however, is that the change in group velocity of light cannot be detected by conventional experiments, such as the following.



Imagine that the Earth (that is, the detector O), the space based light source S and the Sun are at rest relative to each other. There are two synchronized clocks, one at the detector and another at the light source S. The light source S emits a short light pulse, which will travel through the space in the vicinity of the Sun and detected on Earth. The time elapsed between emission and detection of the light pulse is measured. Imagine that the same experiment is repeated in the absence of the Sun. If we follow conventional thinking, the time delay of the light pulse will be slightly smaller in the absence of the Sun than in the presence of the Sun. This is because, in the presence of the Sun the space flow velocity will be slightly reduced in the vicinity of the Sun. The conventional way is to consider infinitesimal lengths of the light path, compute the time delays for each infinitesimal length and integrate. This approach is rooted in ether thinking.

Due to the extreme subtlety of light, as revealed by this author in [1] [2], however, there will be no significant difference between the two time delays. The new theory proposed here states that there will be a significant difference between the two time delays only if the space flow at the

point of the *observer/detector* [1][2] is affected by the Sun. Since in this experiment the Sun is so far away from the observer that the space flow at the location of the observer is not significantly affected, there will be no significant difference in the two time delays. A significant difference will be detected if the experiment is modified by placing the Sun near the observer/detector, as shown below. In this case, there will be significant change in time delay when the Sun is present and when it is absent.

This unconventional result is due to a new theory called Apparent Source Theory (AST) already proposed by this author) [1][2]. It is briefly stated as follows:

The effect of absolute motion of an observer/detector is to create an apparent change in the point of light emission relative to the observer/detector. Therefore, only the absolute velocity of the observer/detector and the distance between the observer and the light source at the instant of light emission are relevant in determining the time delay of light between emission and detection.

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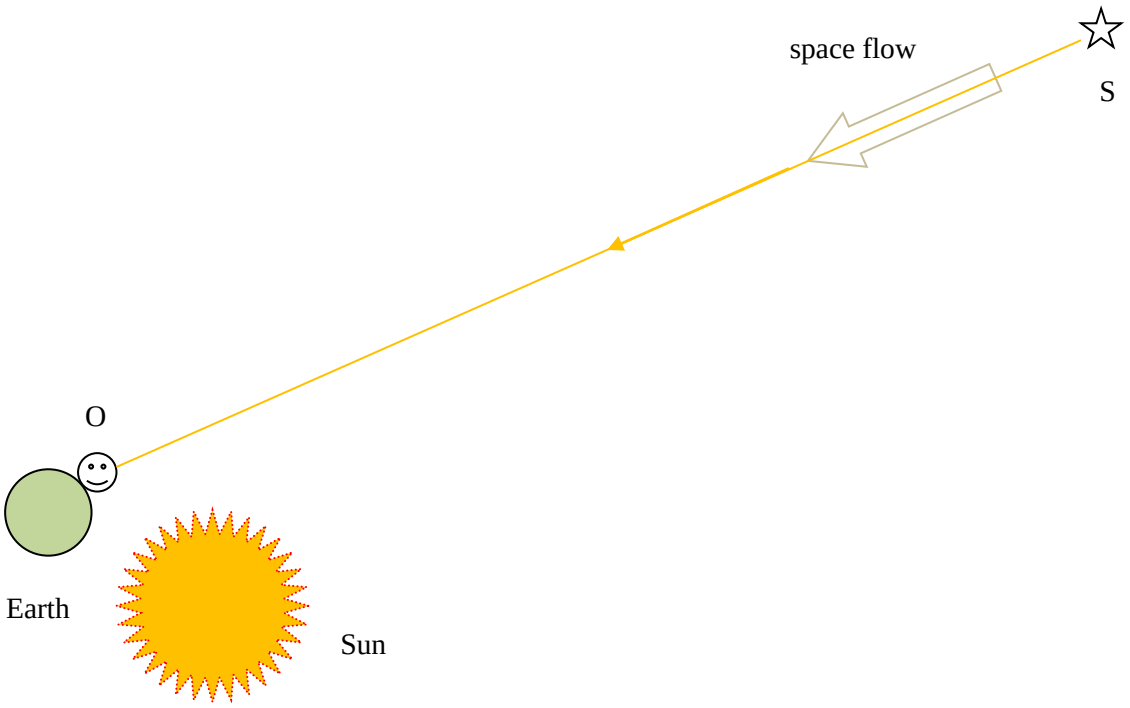

We conclude that there is no star light bending near the Sun. There is also no significant change in time delay of signal traversing Sun's gravitational field.

The modification of space flow in the vicinity of the Sun can be detected only by carrying out local experiments in the vicinity of the Sun and away from the Sun. Imagine that the Silvertooth

experiment is performed in the vicinity of the Sun and then at a point far away from the Sun. The experiment can theoretically detect the change in the velocity of space flow with distance from the Sun.

To stress the extremely elusive nature of light, let us compare the new theory with a somewhat similar theory of Petr Beckmann [3] in this regard. According to Beckmann's theory, the speed of light is constant relative to the local, dominant gravitational field. Therefore, light emitted from a distant star will continuously change its velocity as it encounters and traverses local gravitational fields in its way to the Earth, so that the speed of light is always *c* relative to the gravitational field it is propagating through. Finally, the speed of the starlight will change to be *c* relative to the gravitational field of the Sun as it enters the Solar system and will adjust to be *c* relative to Earth's gravitational field before detection.

The new theory proposed in this paper is crucially distinct from Beckmann's theory. To clarify this let us first assume that the Earth (and the Solar System) is at absolute rest, in order not to complicate the discussion. Therefore, the observer on Earth will be at absolute rest, i.e. no space flow relative to the observer. According to the new theory, the time it takes light to travel from the star to the Earth is still equal to D/c , where D is the distance between the Earth and the star at the instant of emission, even if the light traverses many absolute spaces on its way to Earth. This is despite the fact that we have proposed the idea that absolute space in a region of the universe can be moving relative to absolute space in another region of the universe.

Only if there is space flow relative to the observer/detector will the time delay of light be changed. For example, if space flow relative to the observer on Earth is such that the light is traveling downstream, the time it takes light to reach the Earth from the star will be $D / (c + V_{abs})$, where V_{abs} is the velocity of space relative to the observer. Crucially, all space flows in the regions of the universe traversed by the light are irrelevant in this theory. Only the velocity of space flow at the point of observation/detection is relevant and the flow of space traversed by the light is not relevant. This is unlike ether theory or Beckmann's theory or any other theory based on conventional thinking.

Conclusion

In this paper, we have introduced a new theory of absolute motion. Absolute motion is not motion relative to the hypothetical ether. Absolute motion has been unambiguously detected in several experiments. If absolute motion exists and if we reject the ether, then naturally this leads us to consider absolute motion as motion relative to other physical bodies. We have formulated absolute velocity an object as the resultant of the weighed velocities of the object relative to all matter in the universe. Absolute space is 'fixed' or defined collectively by massive bodies in the universe. The more massive a body and the closer it is to an object, the more influence it will have in determining the absolute velocity of the object. This view of absolute velocity has also enabled the resolution of one existing problem of physics: superluminal galaxies. The new theory can reconcile the two apparently contradicting phenomena : light speed limit and superluminal galaxies. One of the new findings in this paper is that absolute space is local. Absolute space in one region of the universe can be moving with absolute space in another distant region of the universe. Therefore, superluminal galaxies, although moving at superluminal velocities relative to us, are always moving at velocities less than the speed of light in their local absolute space in which they are moving.

Thanks to God and His Mother Our Lady Saint Virgin Mary

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