Apparent Paradoxes in Apparent Source Theory

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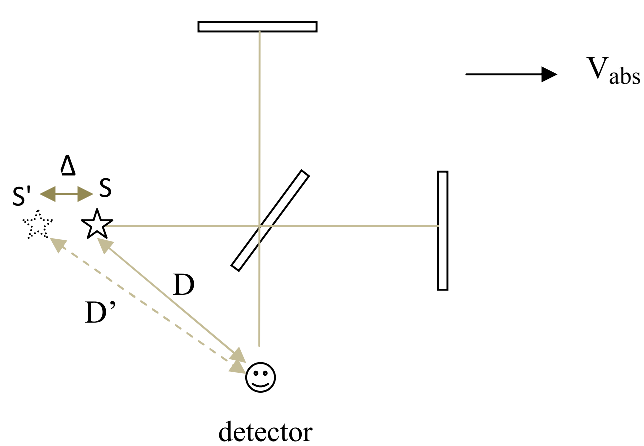
Abstract

According to Apparent Source Theory (AST), the position of a light source changes apparently relative to a co-moving observer, if the light source (and observer) is in absolute motion. Apparent Source Theory successfully explains many light speed experiments. However, there are some (apparent) paradoxes in AST. In this paper, these paradoxes are described and solutions will be proposed.

Introduction

In my previous papers[1][2], I was able to explain many speed experiments by applying Apparent Source Theory (AST). According to AST, the position of a light source changes apparently relative to a co-moving observer, due to absolute motion. For example, in the Michelson-Morley experiment, the effect of absolute velocity is just to create an apparent change in the position of the light source relative to the observer/detector. An apparent change in the position of the light source will not cause any (significant) fringe shift for the same reason that an actual /physical change of light source position will not result in any (significant) fringe shift because, intuitively, both the longitudinal and transverse light beams will be delayed or advanced by the same amount.

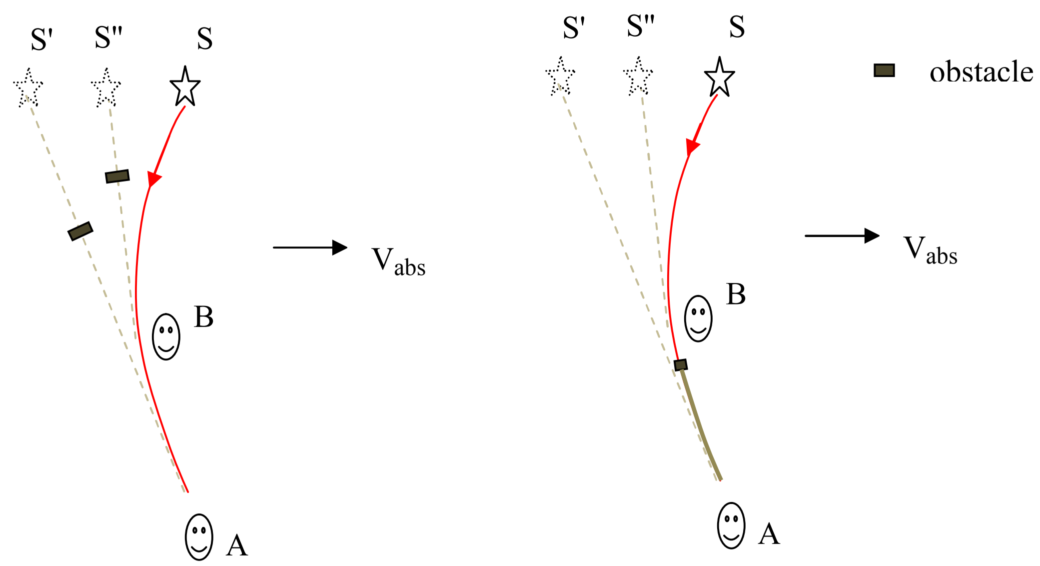


This theory (AST) enabled explanation of many light experiments: the Michelson-Morley experiment, the Kennedy-Thorndike experiment, the Sagnac effect, the Silvertooth experiment, the Marinov experiment, the Roland De Witte experiment, the Venus planet radar range data anomaly (reported by Bryan G Wallace), the A Michelson rotating mirror light speed measuring experiment, terrestrial moving source and moving mirror experiments, and so on.

Despite all these successes, there were some bizarre phenomenon predicted by AST which did not seem to exist physically. In light of the many successes of AST, these paradoxes show that the theory or its interpretation are incomplete, not wrong. We will describe some paradoxes and propose solutions in the next section.

Apparent paradoxes

Let us see a strange phenomenon of light predicted by AST(according to the interpretation in my previous papers). Consider a light source and an observer co-moving with absolute velocity V_{abs} . The light rays from this source will be curved lines. The observer has to point his telescope towards the apparent source to see the light.



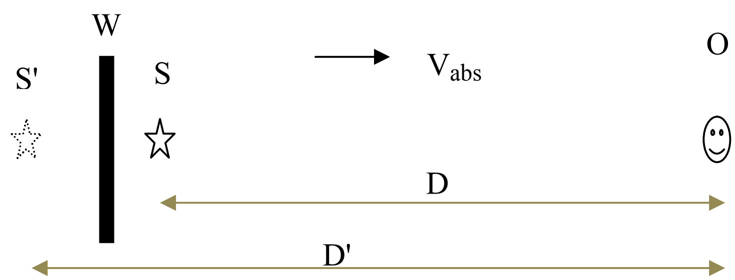
The puzzle is as follows. In the case of co-moving source and observer at absolute rest, placing an obstacle on the source -observer line will block the light going to the observer. What about the case of co-moving source and observer moving with some absolute velocity ? Will placing an obstacle along the (straight) line connecting the apparent source and the observer block the light going to the observer? What about placing an obstacle along the curved light rays ? What about placing an obstacle along the straight line directly connecting the observer and the real source ?

After much puzzlement over this and other paradoxes, the following solution was discovered. This paradox arose and was difficult to resolve because I was reluctant to accept that the bending of light which occurs due to absolute motion of the co-moving source and observer is physical.

Placing an obstacle on the line connecting the observer and the apparent source will not block light. And placing an obstacle on the straight line connecting the real source and the observer will also not block the light. Placing an obstacle along the curved light ray will block the light going to the observer.

The apparent source, as its name implies, is only apparent. The apparent source relative to an observer at a given point is only used to calculate the time delay of light and the direction of arrival of light relative to that observer. Light originates from its physical source and not from the apparent source. But light emitted from the physical source behaves as if it started from the apparent source. Therefore, although the observer has to look in the direction of the apparent source to see light, putting an obstacle between the line connecting the observer and the apparent source will not block light coming to the observer.

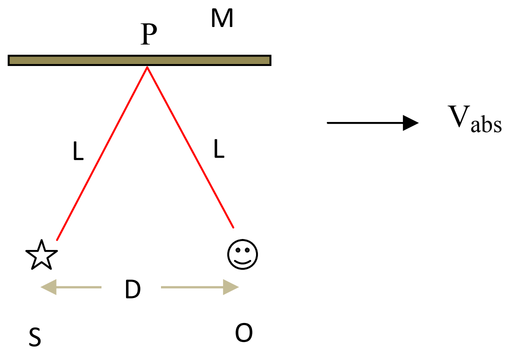
As another example of apparent paradoxes, consider absolutely co-moving source, observer and an opaque wall, as shown below.



With zero absolute velocity, the observer sees light coming from the real source. With large enough absolute velocity, the apparent position of the source can be behind the wall. Will the observer see light now ? The answer is 'yes' because, as we have stated above, only an obstacle on the straight line connecting the physical/real source and the observer will block light coming to the observer. Since the wall is not between the real source and the observer, the observer will see light coming from S'. We stress again that light physically originates from the physical source, but it behaves as if it was emitted by the apparent source. The apparent source seen from a given point is used only to determine the time delay and direction of arrival of light relative to that point.

I faced yet another problem regarding experiments involving mirrors. Consider a light source S, an observer O and a mirror M , co-moving to the right with absolute velocity V_{abs}.

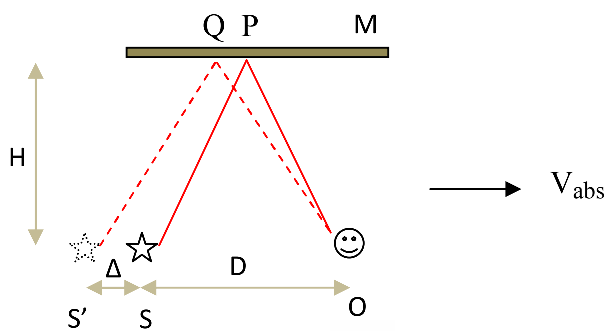
With the system (the light source, the mirror, the observer) at absolute rest, light will reach the observer after reflection from the mirror, as shown below.



If $V_{abs}$is zero, then the time delay between emission and reception of a light pulse will be

$$t_d = \frac{2L}{c}$$

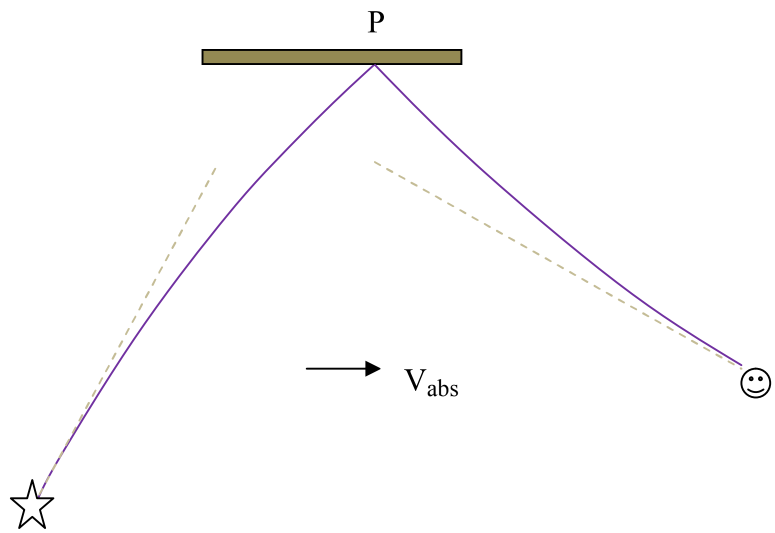
If V_{abs} is not zero, then the source S appears to have shifted away from the observer O by an amount Δ, as shown below.



$$\Delta = D \frac{V_{abs}}{c - V_{abs}}$$

We can see from the figure above that the apparent light (dashed red line)coming from the apparent source S' will reflect from the mirror at (virtual) point Q. The question is : will the observer see light if part of the mirror at point Q was missing ? What about placing an obstacle along the red dashed lines connecting the observer and the apparent source ? What about placing an obstacle along the solid red lines ?

The solution is as follows. Light will be blocked neither by an obstacle along the solid lines nor by an obstacle along the dashed lines. Light going to the observer will be blocked only if there is an obstacle along the curved light path starting from the real /physical source and passing through the observation point. The procedure of construction of the curved light rays has been explained in [1]. Note that the drawing below is only meant to be qualitative illustration and is not accurate.



The other puzzle is:

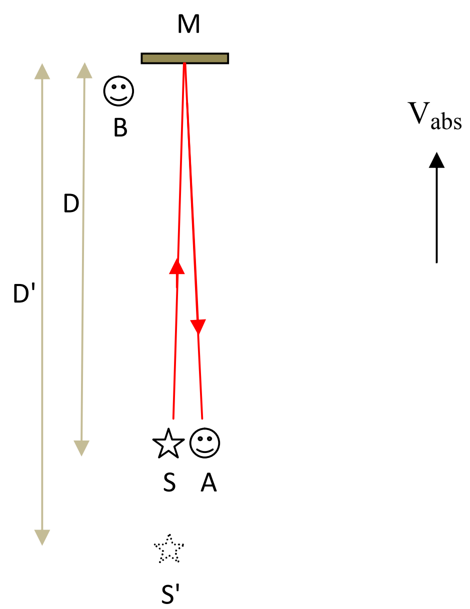
Should there be a physical mirror at the virtual reflection point Q for light to reach the observer ?

OR

Should there be a mirror at the physical reflection point P where the curved light ray reflects from the mirror, for light to reach the observer ?

I propose that physical mirror must be present at the point P where the (physical) curved light rays reflect from the mirror. If there was only an infinitesimal mirror at point P, then this infinitesimal mirror is extended in the plane of the mirror to infinity to construct the curved physical light rays. Point Q is only a virtual, not physical, reflection point and hence only a virtual mirror needs to be present at point Q.

Let us see another apparent paradox[1]. Consider absolutely co-moving light source and observers, as shown below. Observer A is at distance D away from the mirror M. Observer B is so close to the mirror that he/she can detect light from source S just before it is reflected from the mirror. Observer A and light source S are so close to each other that they can be considered to be at the same point in space. The distance between S and A is much smaller than D, so the light can be considered as reflecting back on itself. Therefore, the apparent source is almost at the same position as the real source, for observer A.



The paradox is as follows. According to AST, the time delay between emission of light from the source S and detection by observer A , after reflection from the mirror, is:

$$t_d = \frac{2D}{c}$$

Therefore, for observer A, light is reflected from the mirror after a time delay of:

$$t_A = \frac{D}{c}$$

But observer B, who detects the light just before it reflects from the mirror, detects light after a time delay of:

$$t_B = \frac{D'}{c} = \frac{D\frac{c}{c-V_{abs}}}{c} = \frac{D}{c - V_{abs}}$$

We can see that $t_B > t_A$, which implies that light detected by observer A was reflected at the mirror before observer B detected any light ! This is a novel nature of light ! According to ether theory, and for material waves such as the sound wave, this is logically impossible. A photon detected by observer B is delayed by t_B and a photon detected by observer A is delayed by t_A , before arriving at the mirror.

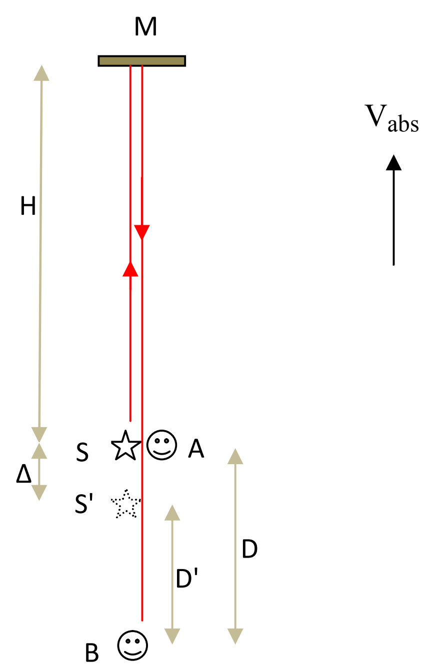
It is impossible to *directly* verify that the time delay $t_A = D/c$, for example by putting a detector at the mirror! A detector at the mirror will record a time delay of $t_D = t_B = D/ (c - V_{abs})$.

All this is counterintuitive, however it should be nothing more strange than the Which-Way experiments in quantum mechanics.

Therefore, it is fallacious to try to analyze light speed experiments by conventional (ether) thinking. The failure of classical and modern physics is deeply rooted in a simplistic view of the nature of light. Both in classical and relativistic physics, light is seen as ordinary local phenomenon. Apparent Source Theory, for the first time in the history of physics, revealed the dual nature of light: local and non-local.

The time delay between emission of light from the source and reflection at the mirror depends not only on the distance between the source and the mirror, but also on the distance between the source and the observer ! This is unlike any of the classical waves, such as the sound wave and the hypothetical ether wave.

To make this point more clear, consider absolutely co-moving light source and two observers (A and B), as shown below. The source S emits an extremely narrow light pulse. A and B detect the light pulse reflected from the mirror.



As in the last case, observer A and the source S are so close to each other that they can be considered to be at the same point in space. Therefore, for observer A, the apparent source is almost at the same point as the real source. The distance between A and S is much smaller than H, so we can assume that the light reflects back on itself. Observer B is at distance D away from the source as shown in the figure. Therefore, for observer B, there will be an apparent change in position of the source. The apparent source S' is now a distance D' away from observer B.

Now let us determine the time delay between emission and reflection of light at the mirror, for observer A and for observer B. As already shown, the time delay for observer A is:

$$t_A = \frac{H}{c}$$

The time delay for observer B is:

$$t_B = \frac{\Delta + H}{c}$$

But[1]

$$\Delta = D - D' = D \frac{V_{abs}}{c + V_{abs}}$$

Therefore, the time delay for observer B will be:

$$t_B = \frac{\Delta + H}{c} = \frac{D \frac{V_{abs}}{c+V_{abs}} + H}{c}$$

We can see that

$$t_A \neq t_B$$

Although observers A and B are detecting the same light pulse emitted from the source, the instant of reflection of light at the mirror is not the same for observer A and for observer B ! This instant is determined not only by the distance H between the source and the mirror, but also on the position of the observer relative to the source ! In the case of the sound wave, the position of the observer relative to the source has no influence (and is irrelevant) on the time instant when sound will be reflected from a wall; the time delay for sound to reach and be reflected from the wall depends only on the distance between the source and the wall.

Therefore, any attempt to analyze light speed experiments with conventional thinking is absolutely fallacious. For example, an argument (criticism) made against AST goes somewhat as follows.

'According to AST, there will be an apparent change in position of the light source as seen by the detector, in the Michelson-Morley experiment. We know that light is reflected from the surface of mirrors by the mechanism of absorption and re-emission of the photons by the electrons on the mirror's surface. Therefore, the electrons of the mirrors are to be considered as sources. Therefore, if AST is to be consistent, there should also be an apparent change in position of the mirrors also, in which case there may be a fringe shift. '

I restate the procedure of AST analysis of the Michelson-Morley experiment as follows.

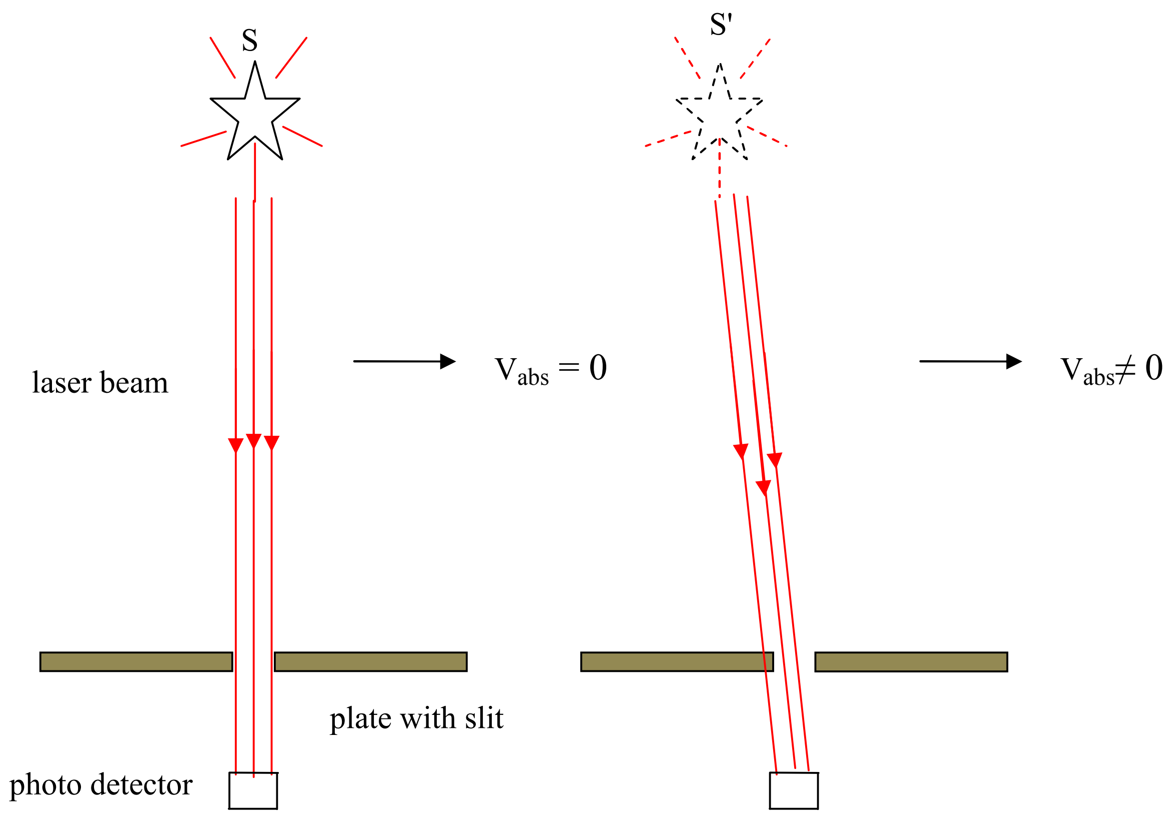
1. Replace the real/physical light source by an apparent source.
2. Analyze the experiment by assuming the speed of light to be constant *c* relative to the apparent source.

In the above procedure, there will be an apparent change in position of the light source only. There will be no apparent change in position of the mirrors. The physical/actual position of the mirrors and all other parts of the apparatus are assumed during the analysis. Therefore, the above argument against AST is based on conventional (ether) thinking.

In AST there is a distinction between a light source and a reflector (a mirror). No such distinction exists in ether theory and conventional physics. According to ether theory, the mirror can be seen as an infinite collection of infinitesimal sources. For sound waves, the reflecting wall can be seen as an infinite collection of infinitesimal sources, and the reflected sound can be determined by the superposition of these sources. Therefore, for ether and sound waves there is no distinction between sources and reflectors. This is not the case for light. For light, the *source* is strictly the origin of the photons (atoms, electrons, ..).

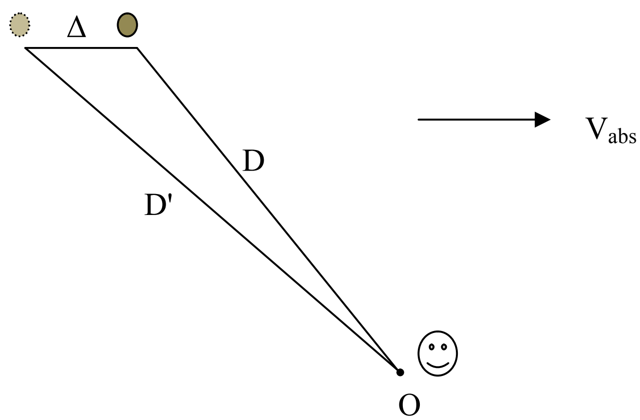
For example one fallacious application of AST in MMX is to consider a two step application of AST. 1. an apparent change in position of the light source as seen by each infinitesimal source on the mirror and 2. an apparent change in position of each infinitesimal source on the mirror as seen by the detector. This is fallacious and is equivalent to the ether theory.

Let us see yet another apparent paradox. Consider an experiment consisting of co-moving light source, plate with slit and photo detector. Assume the light source to be an isotropic point source. At zero absolute velocity, the light source, the slit and the photo detector are aligned for optimum photo detector output. When the system is set in to absolute motion to the right, as shown below, the position of the light source apparently shifts towards the left (from S to S') relative to an absorbing atom of the photo detector. Then one could think that, according to AST, part of the light that reached the photo detector when $V_{abs} = 0$ will be blocked by the plate due to misalignment caused by absolute motion and that the photo detector output will vary with change in absolute velocity.



Now consider real light sources with finite size, with billions of emitting atoms. In this case the principle (Apparent Change of Source Position Relative to Co-moving Observer Due to Absolute Motion) is applied to every infinitesimal element of the source. In this case not only will the position of the source change apparently relative to the detector, but both the shape and the position of the source will change apparently. Therefore, the photo detector output may vary with absolute velocity for real sources.

Consider an infinitesimal element S of the light source (for example an infinitesimal element of the radiating wire of an incandescent lamp) and an observer (photo detector) O at arbitrary point O .



D is the distance between the observer O and the infinitesimal element S when both are at rest ($V_{abs} = 0$). If the infinitesimal element S and observer O are in absolute motion, the position of S changes apparently relative to the observer. The apparent position of the infinitesimal element is determined from the following vector equations:

$$\frac{\boldsymbol{D'}}{\boldsymbol{c}} = \frac{\Delta}{\boldsymbol{V_{abs}}}$$

and

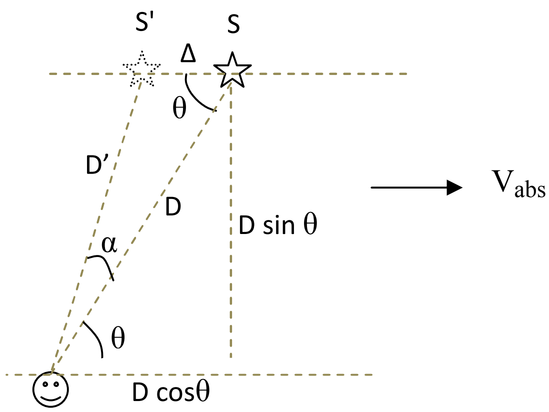
$$\boldsymbol{D} + \Delta = \boldsymbol{D'}$$

where c is the speed of light.

The above equations are for infinitesimal element. For the whole light source, AST will be applied to every infinitesimal element of the light source. The apparent position of every infinitesimal light emitting element is determined, from which the apparent position and the apparent shape of the light source is determined. Note that, when we say ‘source’ we mean, for example, the radiating wire of an incandescent lamp, not other parts of the lamp.

Next we will determine the apparent position of a light source relative to a co-moving observer.

Consider a light source and an observer absolutely co-moving, as shown below.



We want to get the relationship between θ and Δ .

$$\Delta = Dcos\theta - \sqrt{D'^2 - D^2 sin^2\theta} \quad \ldots\ldots\ldots\ldots..(1)$$

$$\frac{D'}{c} = \frac{\Delta}{V_{abs}} \quad \ldots\ldots\ldots\ldots\ldots\ldots.(2)$$

From (1) and (2)

$$D'^2\left(1 - \frac{{V_{abs}}^2}{c^2}\right) + \frac{2DV_{abs}}{c} cos\theta\ D' - D^2 = 0$$

which is a quadratic equation of D' .

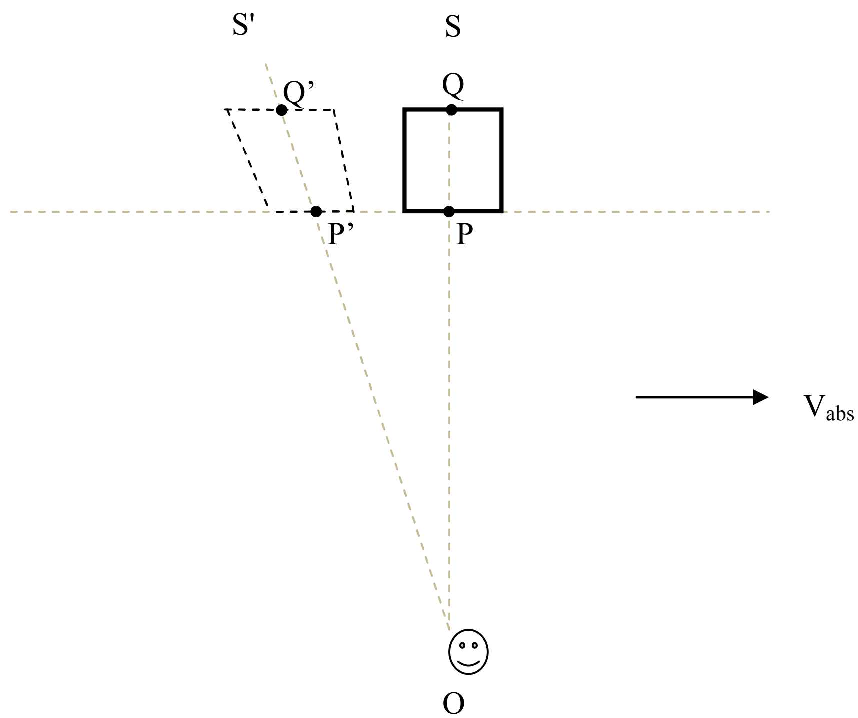
$$D' = \frac{\frac{-2D\,V_{abs}\cos\theta}{c} + \sqrt{\left(\frac{2D\,V_{abs}\cos\theta}{c}\right)^2 + 4\left(1 - \frac{{V_{abs}}^2}{c^2}\right)D^2}}{2\left(1 - \frac{{V_{abs}}^2}{c^2}\right)}$$

$$\Rightarrow\ D' \approx D - \frac{DV_{abs}}{c}cos\theta = D\left(1 - \frac{V_{abs}}{c}cos\theta\right), \text{ for } \frac{{V_{abs}}^2}{c^2} \approx 0$$

From (2) ,

$$\Delta = \frac{V_{abs}}{c}D' \implies \Delta = D\frac{V_{abs}}{c}\left(1 - \frac{V_{abs}}{c}cos\theta\right) \ldots\ldots\ldots\ldots.(3)$$

Just for illustration purpose, assume that the radiating element is a rectangular block S, i.e. every atom of the rectangular block emits light. The apparent position and shape of S is constructed by applying AST to every infinitesimal element of S. For example, the apparent position of an infinitesimal element P will be P’. In the following diagram the apparent positions of two points P and Q have been shown. Note that the diagram is only for illustration purpose and is not accurate.



Conclusion

Apparent Source Theory is a highly successful theory. However, it is accompanied with paradoxes. In light of all the successes of AST, these paradoxes should be only apparent and not real. In this paper we have seen the paradoxes and provided satisfactory solutions.

Thanks to God and the Mother of God, Our Lady Saint Virgin Mary

References

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