ONE WAY SPEED of LIGHT

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Abstract: The velocity of light is measured by a light-specific method (mirrored double paths, uninterrupted photons, etc.). In this study an experiment is presented with a single photon and one way path. Thus, the increasing speed of the distance between the photon and its source can be measured and the essence of special relativity theory can be questioned. If this experiment can be realized, Earth's momentary universal speed can be detected. The measurement direction which gives maximum and minimum values will be interpreted about current expanding speed of universe and expanding direction.

Keywords: Light kinematics; cosmological analysis; special relativity; expanding speed.

Introduction:

In experiments, mirrors are utilized to measure the speed of light in round-trip setup. The high value of speed of light causes difficulties in time determinations; these difficulties are overcome with a rotary wheel or rotary mirror method. However, this type of setup for measurement diverged from the velocity measurement method in mechanics and pertain only to light. This method cannot be used to measure the speed of any other thing. On the other hand, by force of habit in mechanics, speed of light was defined as relative to its first reference frame which is its source or laboratory (earth, -in SR examples- train) and Lorentz transformations and special relativity theory (SR) are procured. The definition of speed of light "relative to its source" claims that the distance between source of light or photon -whichever way the source goes- will always increase by value 'c' and this claim is one of SR's initial postulates. However, it can be possible an alternative interpretation for this experimental result: "the measured value is the universal speed of light" (having the same value in every direction supports this hypothesis). That is to say, we might only measure the universal (relative to space vacuum) speed of light with this known method (round trip double track, continuous photon current, etc.). Objective thinking allows this possibility. In mechanics, the velocity of an object is found in a single travel setup and calculated the velocity by that formula "v = Length / time"; and there is no need to examine whether this velocity is "exact relative" to its initial/first frame; intermediate distance varies by this speed. SR uses this mechanical habit for light kinematics as a hidden postulate. Probably, people (who did not internalize SR) cannot distinguish this nuance.

Is it possible to measure velocity with a single-defined photon and one-way travel setup to confirm the definition of the speed of light used in SR (that is, the assumption that the speed is relative to the first frame or that the photon will always move away from the source with the c speed)? Can today's technology make this happen?

Probably this kind of experiment (velocity measurement by single photon on single path) could have been tried before, but when known value (~300 000 km/sec) could not be found, technological and other methods and their reports may have been arranged in setup of mirrored and double-tracked.

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Unexpected results have the potential for new inferences. Indeed, the “light coordinate system” (LCS) method, which is an alternative to the special relativity theory for light kinematics, provides a theoretical explanation for the different results of one-way measurement

LIGHT COORDINATE SYSTEM (LCS)

Galaxies were unknown (They were called "nebulas"), when the special theory of relativity was published (1905). The technical essence of SR considered only one outer frame (train + rails). There is a hierarchical ranking of reference frames in accordance with their coverage capacities: micro frames, planets, star systems, galaxies, local cluster, superclusters,…, universe, multiverse, space vacuum (Macro frame). The space vacuum is the outermost frame that covers all these configurations. SR already accepts that the speed of light has the same value by all frames; because mirrored measuring gives the same value. In LCS method, the value ‘c’ can be considered as "exact relative" according to only space or LCS, not local objects.

On the other hand, when analyzing the relations between the two objects, the local environment (world) automatically undertakes the role of a common framework, and we do not face a problem as the physical sizes (parametric values) and qualities take value according to this common framework. SR also has applied this (SR considers the local object/source as a reference frame). The analyzing the motion of light is possible by assigning the most external frame as the common reference frame. Moreover, because there are none beyond that frame, this is the most guarantee framework. This common framework (space) is functional as an alternative to SR with coding of the "light coordinate system" (LCS) [1]. In this method, the parametric values of other actors - for example, their speeds, coordinates - will be adapted according to LCS. In natural sciences, to analyze by using a common framework is the golden standard; SR did not assign a common framework for motion analysis of light; instead, it used the relativity method and based on local objects for parameter values (in accordance with the paradigm of the world-centric understanding of universe).

The analyze principles of LCS method [1]:

1-In this study the space vacuum (or LCS) is assigned as the common reference frame. LCS is the most external/outermost frame that includes everything.

2-Test object is a single and identified photon.

3-The relative velocity of the photon is the value c according to LCS.

4-The light source’s relative speed in universal scale is (V_U) according to LCS.

5-The starting points of the photon and source (xi; yi; zi; Ti) are marked on LCS (LCS is not a tangible frame; but, surface of a sheet of paper is functional for theoretical analyses).

6-The relativity type/connection of the photon and its source is “hypothetical relativity” [1]. That is, after releasing the photon, source can go in different directions in accordance with this type, and the intermediate distance increases/decreases with the speed value c +/- V_U .

According to the LCS principles given above, while the photon goes toward + x direction with the speed c (Figure 1), the receptor also goes toward +x with the speed Vu. The length of the photon's path will be longer until the moment of perception T_2:

$$c\,(T_2 - T_1) > L$$

If the light source goes in the - x direction, while the photon goes in the +x direction; the length of the photon way will be smaller: (Figure 2):

$$c\,(T_2 - T_1) < L$$

If the T_1 and T_2 can be detected in both sufficient and necessary precision, value of the world's instant V_U speed (its speed relative to the outermost reference system including the universe) can be calculated. It is possible to get important inferences by interpreting the graphics of results that made simultaneously in different directions.

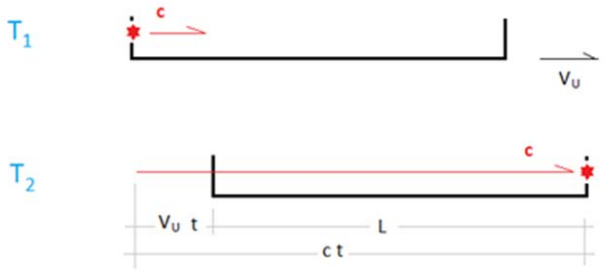

Figure 1- The photon and its source go toward same direction

$$(T_2 - T_1)\,c - L = V_U\,(T_2 - T_1)$$

While the photon goes toward + x direction, light source can go toward -x direction (actually can go in 41253^o spherical degree and every direction of its fractions).

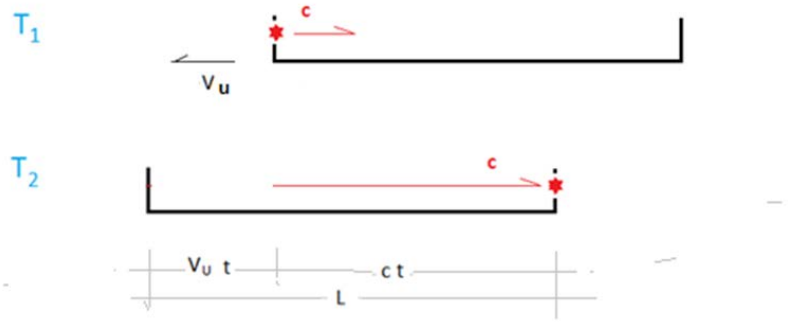

Figure 2- The photon and its source go to opposite directions

$$L - (T_2 - T_1)\;\; c = V_U\,(T_2 - T_1)$$

If the parameters T_1 and T_2 can be determined in this formula, the resultant speed of the Earth according to space vacuum or in universal scale (V_U) -for during the experiment- can be calculated. In this study, some experiments are recommended for the detection of T_1 and T_2 moments. For example, time determination can be done with analogue motion picture technique (figure 3); the first points of

the photon packages that is marked by on the film strip represent the moments T_1 and T_2 (Figure 4). Another experiment is possible by an oscilloscope setup (Figure 5) which is an electronic device. These T_1 and T_2 moments can be directly detected by video of atomic clocks and led markers (Figure 6).

Classical cinema technique:

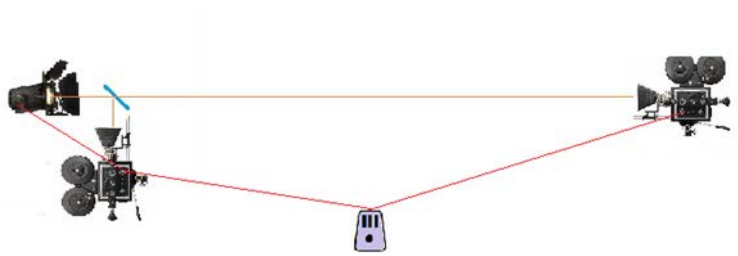

Figure 3- Detection the moments Ti

1-Apparatus and conditions:

1.1. Two identical analog (with film strips) cinema cameras (preferably with fast recording option)

1.2. Two identical atomic clocks.

1.3. One photoflash (spotlight and obturator).

1.4. A led light to mark the starting point on movie strip

1.5. Remote control unit (This is placed on the medium of distance L and the lengths of the cables must be equal).

Preferably, two lighthouses can be used; at nights without light pollution. The intermediate distance should be long enough to distinguish the magnitude of the speed of light, and short enough to not to be affected by the world's universal movement. The control unit will be installed/placed in the middle of the two towers and the cables must have equal length.

2. Control instrument buttons:

2.1- Analog cameras start working and enter constant speed regime.

2.2- Atomic clock image is taken.

2.3- Spotlight and led light work together simultaneously, than obturator works and. The second camera perceives the photon pack.

2.4- The system is stopped.

Afterwards, filmstrips are bathed. Even if the light obturator (cutter) is used, the photon cannot be procured as a single point; but the first points of the line marked by the photon pack on the filmstrip represent the moments T_1 and T_2 (Figure 4). T_1 and T_2 moments can be confirmed by considering the images of the atomic clock on the filmstrip and the first points of the light line.

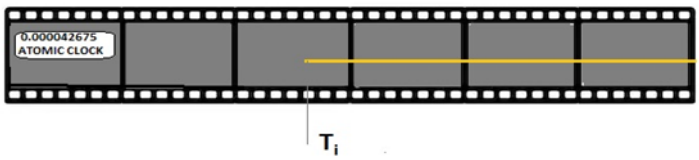

Figure 4- the first point of light line represents the moment T_i

Speed Detection with Oscilloscope

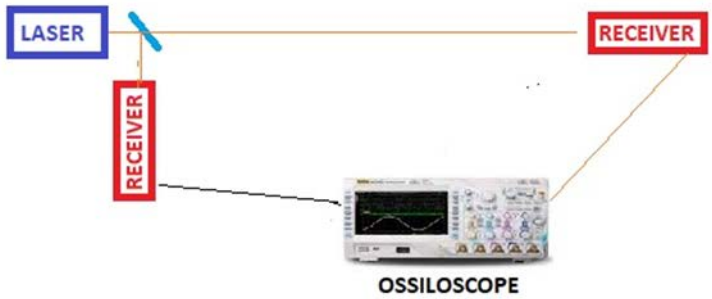

Figure- 5 The detection the time ($T_2 - T_1$) by ossiloscope setup

The experiment setup can be completed with point laser, two detectors and an oscilloscope (Figure 5). This experiment has advantages compared to the analogue movie experiment: it can be performed in broad daylight, in short distances, with lower costs and simultaneously in different directions. Nano seconds can be detected with oscilloscope.

The detection of T_1 and T_2 directly

This experiment can be realized the monitors of atomic clocks and video cameras (figure 6). Syncronization can be provided by led light markers on monitors that are activated simultaneously by remote control mechanism (the cables must be equal length). The distance can be set as 100 meters, accompanied by preliminary precision calculations.

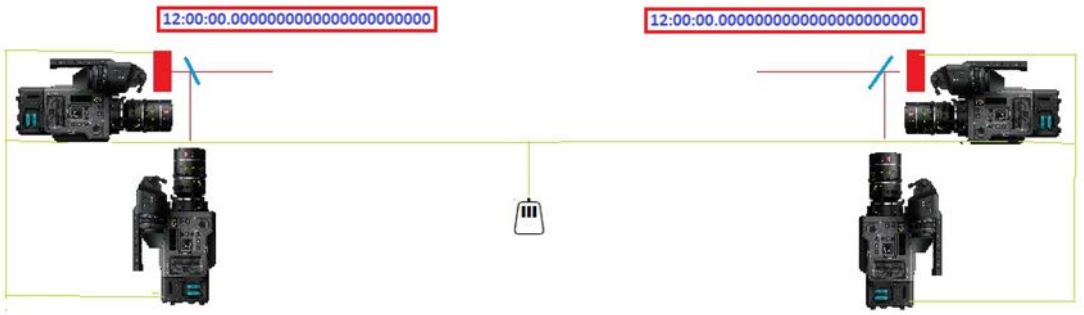

Figure 6- Directly detection of the moments T_1 and T_2

All experiments initially-with round trip mirrored double path- should determine the value of universal velocity of light and its precision and error ratio should take into consideration in accordance with best measurement value 299.792.458 m/s.

Discussion

1- General formula for different directions: $| [(T_2 - T_1)\, c - L] | = V_U\, (T_2 - T_1) | \cos\varnothing |$

2- Current light velocity measurement experiments have to apply mirrored double path to overcome the problem of time detection. In addition, the light source must be on constantly. Continuous photon flow cannot guarantee that the photon determining the result and the initial photon are to be the same. On the other hand, when this current light velocity measurement method is analyzed within the concept of special relativity theory and LCS method, it can be understood that the speed of light ("photon", more accurately) can be measured at the universal scale. The fact that the light velocity value in each direction is the same is a strong evidence that the universal speed is measured (relative according to the space/ LCS). The special relativity theory (Lorentz and Poincaré) realized analyses by accepting the measured value as the light's speed of moving away from the source. If we could distinguish that we could only measure the universal velocity of photon / light, there would be no need for exciting inferences of SR.

3- In the motion of "hypothetical relativity", the intermediate distance of the actors varies with velocity Va +/- Vb. When one of the actors is photon, this value is c +/- Vu. However, when the speed of light is measured by the existing setup, the result will be c again. The value "c" was labelled and used by almost everyone as the speed of moving away from its source. However, this stigma is a mechanical habit; obtaining the same "c" result also supports that interpretation: "We measure the speed of light on universal scale". In fact, constantly achieving the same result in every direction is an evidence for this interpretation. If the "c" value of light's speed is wanted to define "relative speed", this definition is valid for only space vacuum or LCS. As for Lorentz transformations, using "v", that is the speed of source in accordance with world local, and value "c" in universal scale, in same equation/formula is contradictory to rules of methodology.

4- The direction that ensures $L = (T_2 - T_1)\, .c$ equation will mean that the experiment is realized at perpendicular direction to the instantaneous direction of the world in universe. World's resultant movement direction according to LCS is the path that is perpendicular to direction which procures this equation. Since the world is constantly turning about on its axis, this evaluation is instantaneous

5- If the equation $L = (T_2 - T_1)\, .c$ is ensured in all directions (and the experimental precision is accurate), this result confirms the postulate of the special theory of relativity; that is, the distance between the photon and its source always increases with the relation c.t [2]. However, it is known that light velocity measurements in one direction do not give the known c value [4].

6- The perpendicular line of the direction for the lowest V_U value in the diagram of six simultaneous experiments (with 30 degree differences) will indicate the direction of the expansion of the universe for the exact moment of the experiment. Of course, there is a problem of triangulation to record this. However, when the result speed is purified from peculiar vectors, a value can be found for universe expansion rate Vu; which is estimated approximately 0.60 c [3]).

Conclusion:

After humankind has advanced considerably on the basis of substance-based physics rules, it discovered that the main axis in physics is actually ENERGY. In the motion analysis of light, which is an energy type, the first approach has emerged as a special relativity theory, accompanied by physics rules based on matter and locality. However, with the development of methodology, the understanding of prioritizing the big picture and reconsiderations produced the LCS method for light kinematics. The LCS method proposed the need to examine the light motion according to the possible outermost reference frame, and revised/reformed the special relativity theory by performing a cosmological analysis [3].

The measurement experiments proposed in this study was generated with the intention of applying the measurement method (for "exact relative speeds") in mechanics for light, and if these experiments can be realized with sufficient precision, we will have an opinion about the effectiveness / validity of the SR or LCS method in light kinematics.

The potential to learn the current universe expansion speed makes this experiment and its theoretical essence significant.

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