

# Secret of Special Relativity Theory and New Method

Özgen Ersan (zgnrsn@gmail.com)

**Abstract:** This paper elicits and revises the hidden faulty postulate of the special relativity theory and presents new "Light Coordinate System: LCS" method is presented. This method allows for cosmological analysis and provides a detailed calculation of the age of the universe.

**Keywords:** Special Relativity; Light Kinematics; Methodology; Age of Universe; LCS

**Introduction:** There are a large number of papers based on relativity theories [1]. Similarly, there are also those claiming inconsistency [2]. This divergence should be perceived negatively for the essence of science; in natural sciences, there is only one true definition - in the big picture or holistic approach- and hypotheses are eliminated and reduced in number, and eventually all interpretations converge to this single definition. Relativity theories and their variations have so far failed to reach a consensus. In this paper, a new **upper-hypothesis** will be suggested forward to end the positive and negative relativity interpretations, and the principles of a new method (LCS: Light Coordinate System) for light kinematics will be given.

## Theoretical Analysis

The special theory of relativity can be interpreted as taking physics to the universal scale. As well known, every research is based on some axioms or postulates (presuppositions), and inferences must be consistent within their framework. However, the postulates are taken-for-granted opinions/surmises derived from frequent perceptions of natural phenomena and events. However, these perceptions and postulates are formed on the world and are influenced by locality. When analyzing on a universal scale, instead of local postulates - especially those derived from mechanics - we need to be conscious of universal postulates reformed on the universal scale (accompanied by project systematics). When we consider the special theory of relativity in this framework, some flaws can be found for its all postulates:

1- Galilean principle of relativity for easiness of inertial frame: As known, if an object moves linearly with fixed velocity, it can be given the role of reference as an inertial frame. This principle is supported by various mental and real experiments (Generally a pebble is freely dropped from the top of the ship's mast or in the train; in uniform motion the ship or train becomes an inertial frame). However, this principle is valid between objects that have mass; because there is vectorial initial velocity transfer due to massive transfer. Whereas, the light or photon never acquire any addition from the velocity of its source. So **the Galilean principle of relativity does not apply to light**. Einstein, in his book published in 1916 [3], noted with a sentence that there would be no dimension distortion due to projection for the photon that goes perpendicular to the path of the source. The path between the new position of the source and the new position of the photon is used in the analysis of the SR parallel to the +x-axis; When we look at it with the same logic, which is the path to be considered in the perpendicular

photon analysis (Figure 1)? In the special theory of relativity, the K'B option was preferred<sup>1</sup> and ineffectiveness was declared due to effect of projection. On the other hand, in general relativity, the opinion that the photon track going perpendicular according to the cabinet's wall is curved (the same mentality requires the photon to go diagonally/crosswise in case of fixed speed of cabinet ), that is, the path of K'A is valid. **The two theories conflict at this point.** However, a photon directed with a perforated plate filter does not have a chance to go obliquely or curved. The photon path is actually **KA**. In general relativity, it moves horizontally in the cabin relative to the outside observer; however, since the experimenter in the cabin combines the starting point and the destination in his mind, he cannot provide the perception of the real event [4].

2- The belief that the light will move away from every environment with the speed value  $c$  also contains traces of locality. It is a mechanical habit to label and use each measured velocity value as distancing speed from the first reference frame. It is a secret presupposition similar to the dogma that the sun turns around the earth (it is like an unspoken secret postulate of the special theory of relativity; as we all known to almost everyone that it does not even need to be discussed). This is the weakest point of the special theory of relativity [5]. Since energy and light are universal realities, motion analyzes related to them should be assigned as the common frame, the outermost reference system that includes the universe. This common frame is space; or "Light Coordinate System: LCS) can be used to provide functionality. The present light speed measurement device can only measure the relative speed of light with respect to the LCS (discussion 1); it cannot measure its speed relative to a local object or successive reference frames. This option is not a prophecy<sup>2</sup>; the fact that the measurement results are isotropic is strong experimental evidence.

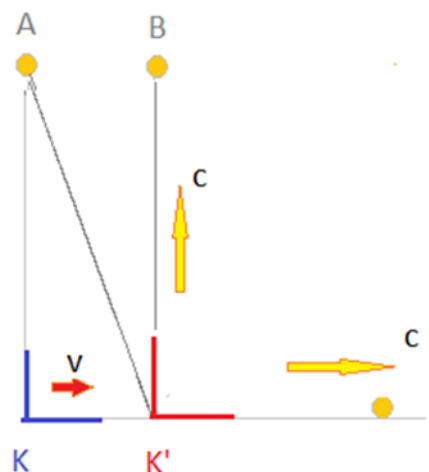


Figure 1- Which is the perpendicular photon's track K'A or K'B?

<sup>1</sup> This preference of SR can also be interpreted as meaning that the photon acquires an initial velocity component from the velocity of its source. As if, the object feature is loaded to the photon.

<sup>2</sup> "FitzGerald contraction" was a prophecy; it had not any clue.

3- The argument of the special theory of relativity that "the laws of physics are the same everywhere in the universe" is true, and it is true that the same result is obtained in every frame in the hierarchical order of the reference or relative frames. However, with literary care, the correct statement is: "This mirrored and round-trip, continuous photon flow measurement experiment measures the relative velocity of light with respect to the vacuum of space everywhere in the universe and finds the value  $c$ ". It is "the measuring action" that is the same throughout the universe; not an "interpretation" or "meaning attribution". The special theory of relativity is locked in the meaning of "The same photon moves away from every reference frame in the universe with the speed of  $c$ ", as it comments on the content of the secret postulate explained in section 2; the majority were also influenced by this first approach. There is a large significant difference in meaning between the expressions "measured" and "goes away" (within cognitive ability).

Understanding that the current mirrored speed of light measurement experiment can only measure the relative speed of the photon with respect to the space vacuum leaves no need for the special theory of relativity. Instead, there must be a functional method that reformed the Light kinematics.

### **Light Coordinate System (LCS) method**

The night sky landscape is a magnificent natural illusion. None of the celestial objects are in their true position and age, and the visible picture does not allow for a holistic cosmological analysis among them. This is because the speed of light is finite and limited; theoretically we cannot see anything simultaneously; extremely large distances cause perceptual distortions. The fact that the speed of light is not infinite is one of the main factors of light kinematics and cosmology. Also, while the motion component of the observer belongs to the present moment, the motion component of the target object belongs to the past; the combination/resultant of them (observational data) is an inappropriate/useless value. Astronomical observation data has such a problem.

In classical physics, the world environment has automatically assumed the role of a common reference frame for each experiment, and the equivalence of the parameters is automatically ensured in this way. At its core, analysis in the common framework is the gold standard. When going to the universal scale, a sequential outer frame of the objects whose relation will be analyzed should be used as a common frame<sup>3</sup>. Energy and light are universal realities; that is, for an analysis on light, the outermost medium (space) including the universe should be a common frame; special relativity theory did not take this methodological requirement into account and gave the local object (source and observer) the role of reference frame. Thereby, -contrary to scientific consistency- it used the source's local velocity ( $v$ ) with the value  $c$  in the same formulas; at least it should have adapted the source's velocity ( $V_U$ ) to the vacuum of space.

---

<sup>3</sup> e.g. The solar system becomes common reference frame for relation of our planets.

Of course, the vacuum of space does not provide a tangible reference. Nature does not care about convenience for science. There is a solution: A paper surface is sufficient and functional for theoretical analysis.

### **Light kinematics and cosmological analysis principles with LCS method:**

- 1- A paper surface can be used as a "Light coordinate system" -instead of space as a common framework for light movement and cosmological analysis
- 2- The defined single photon is taken into account.
- 3- It is important to give direction to the photon track with a perforated plate filter.
- 4- The emission point of a photon [O (Xi; Yi; Zi; Ti)] is marked on the LCS. In the moments after the photon is released, it moves away from this point O with its speed of c.
- 5- The source has passed this point at the time Ti and moves away from the point O with its velocity of Vu adapted to the universal scale (it does not have to follow the photon it emits, it can travel in all directions at 41253 spherical degrees and fractions).
- 6- The relationship between light/defined photon and its source is hypothetical relativity. It does not take any addition from the speed of the light source. The source's role in the event is to produce and release the photon.
- 7- The upper limit of relative velocity of a single object and photon with respect to space is c.
- 8- The distance between two independent objects or photons changes with the velocity value in the vectorial total of their velocities with respect to the vacuum; the hypothetical relativity upper limit is 2c. However, the mirrored measurement setup will still give the value of c (because this measurement experiment can only measure the universal speed of light according to the LCS (not the speed of moving away from its source). Whatever the speed of the observer and the source, a photon always comes to the observer with the speed of c (discussion 4) .
- 9- Cosmological analysis can be made among the largest structures/formations (which are superclusters) in the universe; because, sequential frames according to their capacities are mentioned such as micro frames, the moon, earth, solar system, galaxy, local cluster, supercluster, universe). Applied analysis was realized [6]
- 10- Since the Earth may not be in the center of its own supercluster, the effect of peculiar velocities should be considered as +/- margin of error in cosmological analyses.

### **Discussion**

1- Labeling each measured speed as the distancing speed from the local environment and using it in this sense has become so dogmatic that almost all positive and negative SR texts cannot go beyond this acceptance. Another option has never been thought of. Undoubtedly, this attitude is locality itself. It is a habit originated from mechanics. However, when we consider the content of the present light speed measurement setup, we see that the mirrored round-trip path of the light is used. As the photon and the source move towards the +x direction, the mirror also moves a little, so the travel path becomes longer; shortens on the way back. For this reason, if velocity measurement is made using a one-way and single-defined photon, the value found can be used as the velocity of moving away from the source or local environment

[7]. In the LCS method, the distance between the photon and the source changes with the velocity  $c \pm v_U$  (although the current setup gives a value of  $c$ ).

2- A car gains speed thanks to the friction force it applies to the road, and this speed value is labeled as "real relative"; that is, the rate of change of the distance between the exit point and its new location is this speed; the upper limit of this kind speed is the maximum speed of the car ( $c$  for the light). But the distance between two moving cars on the same road changes with the resultant velocity value in the vectorial total of the velocities of these cars; we can label this as "hypothetical relative velocity". The upper limit of this speed is the arithmetic total of the individual maximum speeds of the cars; for two photon<sup>4</sup> it is twice the speed of light (the radius of a light sphere grows by  $c$ ; its diameter grows by  $2c$ ; but the - hypothetical - observer at one tip of the diameter will always see the other photon at the center - since the act of seeing is limited by the speed of light  $c$ ). If an observer is a factor of an experiment this point must be remembered. The special theory of relativity did not consider these types of relativity. Therefore, the scientific decision process has not been applied about which kind of relativity the motion relationship between light and its source is suitable for (when we consider this; we will find "hypothetical relativity"). The car gains speed through the road (reference frame: road) Light acquires speed in the void (reference frame is the space). The role of the source is to generate and release photons.

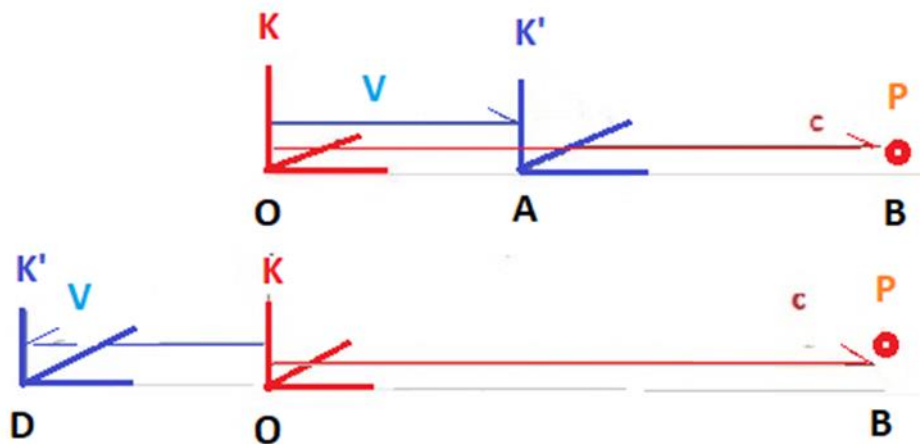


Figure 2- The source going in the same and opposite directions

3- In the special theory of relativity, analysis is made on the basis of the constancy of the speed of light by the coordinates of the photon according to the reference ( $K$ ) and relative ( $K'$ ) systems [3] [5] (Figure 2). The experimenter in the  $K'$  system or on the train has to misperceive the actual amount of path that the photon itself scans, and looks for a solution and produces the SR. But the outside observer -located in the LCS- correctly perceives what is happening; while he can realize that the observer in the train is not aware of the distances  $OA$  and  $DO$ , it is against causality that the observer in the train approves his solution; He doesn't have that luxury/authority. The referring of the  $c$  value to the local frame continues the dogmatic attitude. It is interesting, the

<sup>4</sup> In CERN, when two particles accelerate to big fraction of light's speed, the changing speed of the distance between them (collision speed)  $> c$ .

SR theory says: “The speed of a light source (for example, a star) causes a shortening of the path that the photon it produces has not yet traveled”<sup>5</sup>. However, there is no shortening of the path that has not yet been traveled in nature.

4- Light/photon has come to an eye or receiver with always the speed  $c$  (fig.3). Whatever the distance and directions between the source and the observer at the time  $T_1$ , the distance at the time  $T_2$  (perceiving moment) is  $S_1E_2$  and this distance is scanned with only light's speed  $c$  (the points must be marked on LCS). When an observer is an actor of experiment this result is natural. This detection has significance for the experiment of measurement of light's velocity. Measured value is the coming speed to an eye or a receptor for light (not the changing speed of the distance between photon and its source). The interpretation of this result as distancing speed of a photon from its source is faulty first approach of theoretical physics.

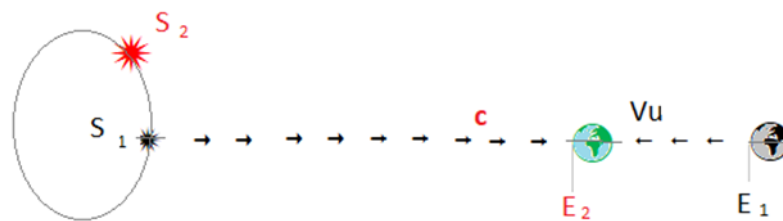


Figure 3- The photon reaches the observer always with the speed  $c$

### Interpretation for Science Philosophy

Although science provides high achievements, it may continue to be wrong in some subjects that are exempt from the anvil of life. The scientific view, which was able to clarify a difficult or even impossible subject in the first Galilean event, can overcome these misconceptions. The idea that the sun revolved around the earth was a dogma until about 500 years ago; had visual experimental evidence. But Copernicus and Galileo took the big picture into account and presented the genuine analysis. In this way, we learned that it would be wrong to try to describe universal events by looking from the local system, which is actually relative. On the other hand, until recently, science was advancing on the basis of matter, but substance-based science could not have a say in some phenomena and events such as mental activities. Einstein's formula  $E = mc^2$ ; and Bose-Einstein density (has also been useful in analyzing the genesis of life). They are Einstein's gifts to humanity and science. Even, matter is derived from energy. Definition adaptations of all kinds of natural events and events continue on the energy axis. Light is also a derivative of energy. For this reason, in special relativity, an understanding that prioritizes light (giving a reference role to the one with wide coverage capacity) can yield more consistent results. LCS method makes light kinematics more functional by giving the role of reference to universal light (light source and observer are in relative position).

<sup>5</sup> The theory mentality aims to increase the numerical value of the distance by shortening the meter etalon. However, both the train/body length and the unit etalon are shortened in some popular science texts (?).

Since the measurement setup and experiment are specific to light, it is important to question what is being measured and to run a scientific decision process. Science will have overcome another secret when it may be comprehended that the relative velocity of the photon with respect to the space, not the local, is measured.

## Conclusion

The special theory of relativity has been widely embraced with admiration for revealing a secret of nature, but it has a secret of its own. The realization that the theory harbors a secret would support the scientific conviction that "the hypothesis that causes the least excitement among the options is closer to the truth".

Positive and negative interpretations and derivative hypotheses produced on the special theory of relativity are stuck on labeling each measured velocity relative to the local environment (the first frame of reference) and using it in this sense. A dogma (SR's secret postulate) should not distract science so much. Due to its structure, the current mirrored measurement system can only measure the relative speed of the light relative to the vacuum or LCS, not the relative speed of the light. This one-sentence option solves the essence of SR and clears the way for light kinematics and cosmological analysis.

## References:

- [1] [https://en.wikipedia.org/wiki/Special\\_relativity](https://en.wikipedia.org/wiki/Special_relativity)
- [2] <https://www.researchgate.net/publication/342420797>
- [3] Einstein A. Relativity: Special and General Theory 1916  
( <https://www.gutenberg.org/ebooks/5001> )
- [4] <https://www.academia.edu/45120184>
- [5] <https://www.academia.edu/42058957>
- [6] Ersan Ö, Ersan I, Light kinematics to analyze space time, Physics Essays, 2013, 26.1 (Doi:10.4006/0836-1398-26.1.49)
- [7] [https://www.academia.edu/43432263/ONE\\_WAY\\_SPEED\\_of\\_LIGHT](https://www.academia.edu/43432263/ONE_WAY_SPEED_of_LIGHT)