

Essential Factors for Light Kinematics and Special Relativity

Özgen Ersan¹

Abstract

The present scientific paradigm does not allow cosmological analysis because of the non-simultaneity of data. However, a cosmological analysis was realized through a new method (the concept of Light Coordinate System). This new method also indicates that the theory of special relativity and light kinematics can be revised and improved to become more functional and useful. In this article, the essence and details of important/supplement factors (especially considering: the types of relativity, sequential chain of reference systems, prioritizing the method of co-reference frame, and relational holism) are explained.

Keywords: Age of universe; Cosmological analysis; Managing mental references; Methodology.

1. Introduction

Karl Popper likens the science as a fishnet, with the meshwork becoming finer and finer [1]. The theory of special relativity (SR) is one of the first approaches for light kinematics and may be reconsidered by advanced cognition and methodology, along with multi-dimensioned and multi-factorial analysis.

In a new method the concept of “Light Coordinate System (LCS)” [2], the absolute form (through God’s eye) of the universe may be a spherical surface in accordance with expansion theory [3] and the visible form (through an observer’s eye) of the universe must be perceived as an asymmetric ellipsoidal surface (like a water drop or an egg) due to the finite/limited value of light’s velocity. Observational and simultaneous astronomical parameters can be theoretically calculated using these absolute and visible forms for various ages of the universe and some diagrams can be generated according to these ages. The similarity of diagrams (e.g., Hubble constant – distance, redshifts-distance), including “theoretically visible” and “real observational” data, verifies the consistency of this method. Besides, it has been indicated that in accordance with their distances different values of the Hubble constant ($H_0 = 80 - 50$ km/sec/mpc) represent a unique value (H_A) of the absolute form of universe; observational values are deformed because of NVE.² Hence, the actual age of the universe can be determined by overlapping some real observational data.

2. The essences and details of supplemental factors

2.1. The types of relativity are:

(a) Genuine relativity: A vehicle gets its speed by pushing the road. The speed of this vehicle is defined as “genuine relative” to the road. The contribution of the road is essential. The power is applied to the road continuously for genuine relativity. The upper limit of genuine relative speed is ‘c’ (the value of light’s velocity).

(b) Hypothetical relativity: The changing speed of the distance between two vehicles which are moving on the same road. This speed is defined as “hypothetical relative.” The vehicles do not apply power to each other. The upper limit of hypothetical relative speed is $2c$ (discussion section 3.2).

(c) Momentary/temporary relativity: When a player throws a ball, the ball’s speed according to the player is “momentary relative”. The power has been applied momentarily. After throwing, the

¹ zgnrsn@gmail.com

² Natural Visual Error: we never can see simultaneously because the velocity of light is not infinite.

motion of the ball is transferred to the type of hypothetical relativity; the player can go anywhere freely. However, it can be said that the ball's speed is "genuine relative" according to the ground. The ground is the co-reference frame for the player and ball. For genuine relativity, the starting point of the ball is marked on the ground, not by the existence of player (or his/her following positions).

Which one is significant for light (an identified photon)? SR prefers to use merely the concept of "genuine relativity" for the motion of light according to its source and every frame [4]. However, requirements of genuine relativity are not realized for light; the source and photons never apply a power for the motion. Further, the source can go in any direction freely after the photon was emitted, like the player (the increasing/decreasing speed of intermediate distance is the vectorial total of their speeds, but if an observer is an actor in the experiment he never can perceive a larger value than c). Eventually the velocity of a photon according to its source is "momentary relative" and then "hypothetical relative" in the following time.

2.2. Primacy of co-reference frame:

In scientific analyses, a co-reference frame is used as a primary method for calibration and equivalence of parameters. The Earth is usually an automatic co-reference frame for physics and other sciences. Also, the relativity method can be considered if it is confirmed by the primary method. SR neglected to assign a co-reference frame and it isolated light and its source; thereby SR marks the starting point of the photon by the existence of its source because of this isolation. A co-reference frame is possible for light kinematics: most external frame; outer space (vacuum) or virtual light coordinate system (LCS). The emitting point of an identified photon is marked on space or LCS by its coordinates (x_i, y_i, z_i, T_i) . When we replace the photon with a ball and the player as its source and the ground as co-reference frame, we can distinguish that the distance between them cannot be calculated by only the value c (comprehensive analysis is in discussion section 3.4.). We must consider the big picture: The velocity of light is already 'c' according to space or LCS (SR allows this, too). We must use the universal value V_U for the source's speed in accordance with scientific integrity/equivalence [5]. Of course, space is not tangible; however, a sheet of paper is functional and sufficient for theoretical analyses.

2.3. The presence of multi-sequential reference/relative frames:

There is a chain of sequential reference systems. The ranking follows within our present knowledge: Micro frames (e.g. a train), secondary planet (Moon), planet (Earth), star (Sun), galaxy (Milky Way), galaxy group (local or super), filament formation, visible universe, multi-cellular formation, macro systems and as the most external frame, outer space (or LCS). Where is the position of light in this chain? In some light experiments and SR, the source is placed at a micro reference frame (e.g., train [6]) and the source's speed (v) is a relative value according to local place. In nature, light sources are sky objects (stars, galaxies, etc.) and the velocity of light is a universal value (actually, we are allowed to measure just the universal value of light's velocity). The same value of measurements for every direction indicates that we can already measure the universal value (according to space) of light's velocity. This determination or option is in humanity's cognitive capacity (key argument: every direction). We may perceive that light travels in space, no matter where its source is placed (An inference for methodology: we must research which other probable hypotheses are supported by the result of our experiments except initial intention).

2.4. Galilei's relativity principles

G. Galilei presented two principles for the relativity method. An object which has uniform motion can be considered an inertial frame; it is a postulate of SR [4]. We can distinguish that the light has fixed velocity and it travels linearly; hence light or its reference frame (space) is a major candidate for a reference role [5]. Second, one of the objects that has higher capacity (sun, light, etc.) must be preferred for the reference role (On the relation of Moon and Earth the reference and relative roles are consistent and the opinion of "Moon rotates around Earth" is significant. However, the dogma "Sun rotates around Earth" was believed and defended because of the visual evidence. Copernicus and Galilei declared orbital and axial rotation of Earth around the Sun. The essence of our mistake is translocation of reference and relative roles. If our position is at a relative role, and if we assign our local place as a reference frame, perceptions and conclusions -about the object at real reference role- may be wrong/contrary to facts. The light is a universal reality like energy; light has higher capacity compared to its source). As a result, Galilei's

relativity principles also imply the light or -functionally- most external frame (space or LCS) for the reference role.

Eventually for every scientific analyses, to consider necessary and sufficient parameters/factors or superposing step has importance. In light kinematics, if some parameters/factors are neglected, it is probable that an inference will be generated like the special theory of relativity.

3. Discussion

3.1. SR mentality uses the concept of “genuine relativity”:

SR insists that on the genuine relativity of light's velocity, the expectation for measurement results was the value $c \pm v$; thereby the result value c was accepted as “genuine relative”. If an experimenter intended to measure universal value (according to space) of light's velocity, he/she would use the same measurement method and the result would be called “universal velocity” with the similar attitude. We may reconsider and evaluate the results of experiments for different hypotheses, excluding their initial intention too.

3.2. The top limit of speed for “hypothetical relativity” is $2c$:

The top limit value ‘ c ’ of the SR mentality also indicates that it uses the concept of just “genuine relativity” for the motion of light. The photons which emit at the same moment generate a light spherical surface whose radius increases by the value ‘ c ’. The diameter of this light sphere inevitably increases by the velocity ‘ $2c$ ’ (this result is within human cognitive capacity). Naturally, an observer -who is placed on the tip of a diameter-, cannot see the simultaneous position of the other antipode.

3.3. The laws of physics work everywhere in the cosmos:

SR accepts the velocity of light is genuine relative according to every reference frame [4] [6]. To directly label every measured speed as “genuine relative” is our mechanical habit. The measurements by the same system/method give the same value at every place in the cosmos. A well-directed phrase is: The action of measuring works the same everywhere in cosmos. We may perceive the difference (we can distinguish a better/elaborative technical definition of measured value. We can measure the universal velocity of light according to space/LCS).

3.4. Does the principle of action-reaction work for the reputation of SR?

We explained other effective principles/factors and factors for light kinematics and SR (like considering the oxidation against the phlogiston theory [7] about burning event). Of course, SR may claim that it has a powerful argument to retain its reputation: As in the player-ball-ground relation, the ball's speed is genuine relative according to the ground, not according to the player, because the player can go to a new position freely. After throwing, the intermediate distance increases by the vectorial total value of their speeds. But when the ball and player are considered in space, intermediate distance will increase by only the ball's speed according to the player; the ball's speed is also escaping speed from the player, in other words, “genuine relative” speed. Some people can be convinced by this “space-based” argument to defend SR. However, we may think a further step ahead: the player will also get a speed (at the rate of objects' masses) due to the principle of action-reaction (Newton's 3rd law); because they are material, player and ball have masses. Light does not have a measured mass; hence, a massic interaction is not generated between the source and its light (key nuance). In the space option, the starting point of an identified photon is marked on LCS; “hypothetical relativity” is valid for light/photon again.

4. Conclusions

In the cosmos, visible and invisible everything are in relational holism. Any one of several effective factors must never be neglected in analyses. When we analyze the motion relation of two

objects we must prefer to assign the higher capacity or its outer frame for reference role. Thereby for the motion analysis of light and its source, the competent frame is light (Light also has uniform motion; even, light does not accelerate); functionally the co-reference frame is space or preferably LCS. A cosmological analysis has been realized by considering these mentioned factors and the actual age of universe can be calculated persuasively [2].

We have the opportunity to closely examine physical events on Earth. However, we need a holistic view for universal events. Moreover, henceforth the main axis of physics is based on energy. Light is a kind of energy too. In the relation of material and energy, prioritizing the light must be more significant than its source for the reference role in light kinematics and SR.

References

- [1] Popper R.K, Bilimsel araştırmanın mantığı³, 8th ed. Istanbul: YKY; 2018, Turkish
- [2] Ersan Ö, Ersan I, Light kinematics to analyze space time, Physics Essays, 2013, 26 (1)
(Doi:10.4006/0836-1398-26.1.49)
- [3] Sandage A, Edwin Hubble, JRASC, 1989; 83.352S
- [4] Einstein A, Zur Elektrodynamik bewegter körper, Annalen der Physik, 1905
- [5] Ersan Ö, Gizem tutkusu korumasında “Sahte bilim”⁴ 2nd ed, Izmir: Info; 2008, Turkish
- [6] Einstein A, İzafiyet teorisi⁵, 5th ed, Istanbul: Say;1998, Turkish
- [7] <http://www.oxfordreference.com/view/10.1093/oi/authority.20110803100323514>

³ The Logic of Scientific Discovery

⁴ Under the protection of mystic passion “Pseudo science”

⁵ Relativity, the special and the general theory