Moving Objects Observation Theory Replacing Special Relativity

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Abstract: *This paper introduces the basic hypotheses and viewpoints on space-time of the special relativity as well as of the moving objects observation theory. It proposes a new concept called visual space–time. Also, the relationship among the moving coordinate systems true space–time, fixed coordinate systems visual space–time and fixed coordinate systems true space–time has been established. From comparing the analysis, the author concluded that moving objects observation theory has solved the measurement problem of moving objects. Moving can not cause length change, time change or mass change. Nor is there light barrier. So the special relativity should be abandoned.*

Key words: s*pecial relativity, Lorentz-transformation, velocity of light, Einstein, moving objects observation theory*

0. Introduction

In order to resolve measurement problem of moving objects, Einstein presented the special relativity a century ago [1-2]. Now, this theory as well as its author Einstein has already been well-known all over the world. University and college choose the special relativity as a required course. But the rationality of special relativity's set-up process and the accuracy of its inference have always been doubted or criticized [3-21]. Recently, Wang Zhihai and Xu Hui delivered the observation theory of moving objects, which solved the conversion between observations and the real values, and get rid of one big theory obstacle in way of the physics development.

This paper introduces Einstein's special relativity as well as Xu Hui and Wang Zhihai's observation theory of moving objects in brief. It also compares and analyses the two theory's basic assumption and their transformation formulas in detail. It suggests that the observation theory of moving objects replace the special relativity.

1. Outline of Special Relativity [1-2]

1.1 The basic assumptions of the special relativity

(1) Principle of relativity. For describing the whole laws of moving, all inertial coordinate systems moving uniformly along beeline one to another are equal.

(2)The principle of the constant velocity of light: the speed that light travels in the vacuum is constant, and it has nothing to do with the moving state of its light source[1]. Speed of light in vacuum measured in all inertial coordinate systems moving uniformly along beeline one to another are equal[2].

1.2 Lorentz-coordinate transformation

There are two coordinate systems K and K' ($OXYZ$ and $O'X'Y'Z'$) in Fig.1. Each corresponding axis parallels the other and makes uniform motion in a straight line. The coordinate system K relatives to K', having speed v. The direction follows X axis. And starts when O coincides with O'.

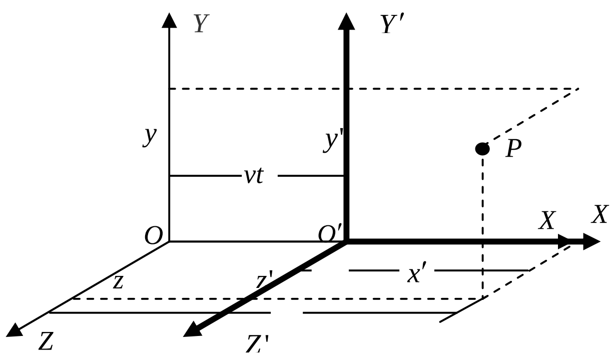

Fig.1 Coordinate Transformation

Suppose (x, y, z, t) expresses that an event appears in the coordinate system K at the time t, while the same incident appears in the coordinate system K' at the time t' at the point (x', y', z'). Then, the space-time coordinate systems (x, y, z, t) and (x', y', z', t') which express the same event obey the Lorentz- coordinate transformation:

$$\left.\begin{aligned} x' &= \frac{x - vt}{\sqrt{1-(v/c)^2}} \\ y' &= y \\ z' &= z \\ t' &= \frac{t - \frac{vx}{c^2}}{\sqrt{1-(v/c)^2}} \end{aligned}\right\} \qquad (1)$$

$$\left.\begin{aligned} x &= \frac{x'+vt'}{\sqrt{1-(v/c)^2}} \\ y &= y' \\ z &= z' \\ t &= \frac{t'+\frac{vx'}{c^2}}{\sqrt{1-(v/c)^2}} \end{aligned}\right\} \tag{2}$$

in which c represents velocity of light.

The derivation process of Lorentz-coordinate transformation is as follows.

For the point O, observing it from the coordinate system K, no matter what the time is, it is always $x=0$, but observing it from the coordinate system K', at the time of t', the coordinate is $x'=-vt'$, that is, $x'+vt'=0$. From these, at the same space and time point, the numbers x and $x'+vt'$ change into zero simultaneous. This makes people think naturally that anytime x and $x'+vt'$ have a scale relation. Suppose this constant of proportionality as k, so

$$x = k(x'+vt') \tag{3}$$

Discuss the point O' in the same way, and get

$$x' = k'(x-vt) \tag{4}$$

According to the relativity principle of the special relativity, K equals to K', the two equations above should be the same, so constants k should be equal to k'. Then, there is

$$k = k' \tag{5}$$

So

$$x' = k(x-vt) \tag{6}$$

For acquiring certain transformation rule, the constant k must be got. According to the principle of the constancy of the velocity of light, assume that at the time（$t=t'=0$）when light signal coincidences at O and O', it starts from the coincident point and moves forward along the coordinate axis OX, and at anytime t (t' in coordinate system K'), the light signal's coordinates in the two coordinate system are:

$$x = ct, x' = ct' \tag{7}$$

Multiply (6) and (3), then substitute (7) into the result

$$k = \frac{c}{\sqrt{c^2-v^2}} = \frac{1}{\sqrt{1-(v/c)^2}} \tag{8}$$

Then get

$$x' = \frac{x-vt}{\sqrt{1-(v/c)^2}}, t' = \frac{t-\frac{vx}{c^2}}{\sqrt{1-(v/c)^2}}$$

$$x = \frac{x'+vt'}{\sqrt{1-(v/c)^2}}, t = \frac{t'+\frac{vx'}{c^2}}{\sqrt{1-(v/c)^2}}$$

1.3 The space-time view on special theory of relativity

Based upon Lorentz transformation, special relativity finds out:

(1) Question of simultaneity. If two events appear at two points in a coordinate system synchronously, times that these two events appear measured in another coordinate system are not equal.

(2) Question of contraction in length. In a coordinate system be of relative speed, the length of an object measured along the speed direction of the system is shorter than that measured in another coordinate system in which the object is at rest.

(3) Question of extend of time. The time measured in a coordinate system being of relative speed with the place an event appears is longer than that measured in another coordinate system in which the place is at rest.

1.4 Dynamics of special relativity

(1) Mass of an object measured in coordinate system being of relative speed with the object is larger than that measured in another coordinate system in which the object is at rest.

(2) Energy of an object equals its mass multiply square of light speed.

2. Summary of the moving objects observation theory[20-21]

2.1 Basic assumptions on the observation theory of moving objects

(1) For describing the whole laws of moving, all inertial coordinate systems moving uniformly along beeline one to another are equal.

(2)The light speed relative to its light source in vacuum or the other mediums is c.

2.2 Some concepts

(1) Absolute time. Suppose a passel of same-structured clocks run at the same velocity (or "hour rate"), and adjust them at the same time they point at the same position. No matter what kinestate's reference system these clocks are put or in which part of the reference system these clocks are put, these clocks still move at the same velocity and point to the same place at the same time.

(2) Actual time. Define the time that when event occurs, the clock points to as actual time. Please pay attention that the time includes two meanings: "moment" (the point at time coordinate) and "time interval" (the interval between two time points).

(3) Visual time. This is the surveying office time that

observer get from the moving event with the help of the light signal at surveying office.

(4) Absolute length. The length measured by the same constructed rulers at any position in any coordinate systems.

(5) Actual length. The length measured by a ruler in the coordinate system with which the observed object moves.

(6) Visual length. This is the surveying office length that observer get from the moving event with the help of the light signal at surveying office.

(7) Visual space-time. The surveying office time and space that observer get from the moving event with the help of the light signal at surveying office.

2.3 Transformation between visual space-time and moving space-time

Fig. 1 shows two Galileo coordinate systems, if event happens statically in coordinate system K', then measure from the K, there is :

$$\begin{cases} x_{\mathrm{v}} = \dfrac{x' + vt'}{1 - v/c} \\ y_{\mathrm{v}} = y' \\ z_{\mathrm{v}} = z' \\ t_{\mathrm{v}} = \dfrac{t' + x'/c}{1 - v/c} \end{cases} \qquad (9)$$

in which, $(x_{\mathrm{v}}, y_{\mathrm{v}}, z_{\mathrm{v}})$ is visual coordinates and t_{v} is the visual time in the coordinate system K; (x', y', z') is the actual coordinates and t' is the actual time in the coordinate system K'; v is the separating velocity the two coordinate systems have along the direction X, if getting closer the value will be negative.

2.4 Visual time interval and visual length

From (9), the relationship between visual interval and actual interval, visual length and actual length in moving direction are

$$\begin{cases} \Delta t_{\mathrm{v}} = \dfrac{\Delta t'}{1 - v/c} \\ \Delta x_{\mathrm{v}} == \dfrac{\Delta x'}{1 - v/c} \end{cases} \qquad (10)$$

While the moving-away coordinate system has an event happening, the observed interval for the action is longer than its actual interval. For example: the moving-away watch has been moving for an hour while the observer's watch in the relative still coordinate system says it has been running for an hour and ten minutes. While observing an event in a moving-back coordinate system, visual time is shorter than its actual time. For example: the moving-back watch has been moving for an hour while the observer's watch in the relative still coordinate system says it has been running only for fifty minutes

When observing a moving-away object, its length seems to be elongated in its moving direction; while observing a moving-back object, its length seems to be shortened in its moving direction.

2.5 The instauration of true value

Because of the measurement effect caused by the limitation of velocity of light, the measured result is not the objective thing itself. Only do get rid of the measurement effect, can get back the objective thing itself:

$$\begin{cases} x = x_{\mathrm{v}}(1 - \dfrac{v}{c}) \\ y = y_{\mathrm{v}} \\ z = z_{\mathrm{v}} \\ t = t_{\mathrm{v}}(1 - \dfrac{v}{c}) - \dfrac{x'}{c} \end{cases} \qquad (11)$$

$$\begin{cases} \Delta t = \Delta t_{\mathrm{v}}(1 - \dfrac{v}{c}) \\ \Delta x = \Delta x_{\mathrm{v}}(1 - \dfrac{v}{c}) \end{cases} \qquad (12)$$

In the equations above, (x, y, z) is the real coordinates of the coordinate system K, and t refers to its real time.

2.6 Real space-time transformation between two Galileo Coordinate systems

Putting (9) into the equation (11), there are:

$$\begin{cases} x = x' + vt' \\ y = y' \\ z = z' \\ t = t' \end{cases} \qquad (13)$$

3. Comparisons between the special relativity and moving objects observation theory

Table 1 is comparisons between the special relativity and observation theory of moving objects. It is clear that the observation theory of moving objects has not only the theoretical and practice foundation, but no fallacy existing.

Table 1 Comparisons between the special relativity and observation theory of moving objects

Item		Special relativity	Observation theory of moving objects
Basic supposes	1	For describing the whole laws of moving, all inertial coordinate systems moving uniformly along beeline one to another are equal.	
	2	The speed that light travels in	The light speed relative to its light source in vacuum or the

	the vacuum is constant, and it has nothing to do with the moving state of its light source. Not verified.	other mediums is constant. Verified.
Space-time transformation equation	$x=\frac{x'+vt'}{\sqrt{1-(v/c)^2}}$, $y=y'$, $z=z'$, $t=\frac{t'+vx'/c^2}{\sqrt{1-(v/c)^2}}$	$\begin{cases} x=x'+vt' \\ y=y' \\ z=z' \\ t=t' \end{cases}$
Length shortening	Use to be shortened.	No shortening for the real length. Away, the visual length extends; near, the visual length shortens.
Simultaneity	At different time.	At the same time.
Time prolonging	Use to be prolonged	No prolonging for the actual time. Away, the visual time prolongs; near, the visual time shortens.
Mass augment	Augment	No
Light barrier	Yes	No
Paradoxes or mistakes	Yes	No

4. Conclusions

(1) Observation theory of moving objects has resolved the measurement problem for moving objects (especially the high-speed objects).

(2) Moving can not trigger the change of length, time and mass. There is no light barrier.

(3) The special relativity should be abandoned.

References

1. A. Einstein. On the Electrodynamics of Moving Bodies. *The Principle of Relativity*, Methuen and Company Ltd. of London, 1923.
2. Cheng Shuozhu, Jiang Zhiyong. *General Physics*. Beijing: People's Education Press, 1978: 231-254. (In Chinese)
3. Xu Shaozhi. The Mathematic Basis of Relativity is Wrong. *Invention and Innovation*, 2001, (1):32-33. (In Chinese)
4. Xu Shaozhi. To Look at Scientific Platform, New Events Happen in China. *Invention and Innovation*, 2001, (2):34-35. (In Chinese)
5. Xu Shaozhi. Misunderstandings on Mass-Energy Relations. *Invention and Innovation*, 2002, (2):32. (In Chinese)
6. Xu Shaozhi, Xiang Qun. Generalized Relativity Is So Different From Science. *Invention and Innovation*, 2002, (3):30-31. (In Chinese)
7. Xu Runsheng. SR Goes Against Factuality Principles. *Invention and Innovation*, 2002, (10):32. (In Chinese)
8. Zhu Jidong. Discussing the Fundament of the Experiment about the Special Relativity. *Journal of Shanghai University of Electric Power*, 2003, 19(3):57-60. (In Chinese)
9. Cui Jidong. On China's Own Innovation Way -Impressions of Reading "Rethought on Relativity". *Invention and Innovation*, 2003, (3):34. (In Chinese)
10. Lei Yuanxing. Criticizing Voice on Relativity is Worth Analyzing in Two Ways-The First Impression of "Rethought on Relativity". *Invention and Innovation*, 2003, (3):37. (In Chinese)
11. Huang Zhixun. Theoretical Development and Experimental Examinations in Special Relativity. *Engineering Science*, 2003, 5(5):8-12. (In Chinese)
12. Liu Dayi. A Debate between Relativity and the Concept of Classics' Space-Time & Matter. *Invention and Innovation*, 2003, (9):36. (In Chinese)
13. Xiang Qun. Do Away with Superstitious and Read Relativity Cautiously. *Invention and Innovation*, 2003, (10):36. (In Chinese)
14. Liu Dayi. Making Zero Divisor Is a Math's Mistake. *Invention and Innovation*, 2003, (10):37. (In Chinese)
15. Huang Demin. *On the Essence of Physical phenomenon –Matter Effect Study Challenges Relativity*. Shanxi Science and Technology Publishing House, 2001. (In Chinese)
16. Song Zhenghai, Fan Dajie, Xu Shaozhi, Hao Jianyu. *Rethinking on Relativity*. Earthquake Publishing House, 2001. (In Chinese)
17. Qi Ji. *New Physics*. Publishing House of Northeast Forestry University, 2003. (In Chinese)
18. Li Zifeng. SR Origins from a Minstaken Explanation on Velocity of Light Constant Principle. *Finding*, 2005, Supplement: 28~132. (In Chinese)
19. Li Zifeng, Li Tianjiang, Wang Changjin, Wang Zhaoyun, Tian Xinmin. The Essence of Special Relativity and Its Influence on Science and Philosophy as Well as Society. *Scientific Research Monthly*, 2005, No.13: 80-83.(In Chinese)
20. Wang Zhihai,. Correction on Observation, *Matter Regularity*, 2004, (4):186-190. (In Chinese)
21. Xu Hui. Observation theory of moving objects, *Matter Regularity*, 2005, (13):24-29. (In Chinese)

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