Problems Relativity cannot Solve or Induce Wrong Results

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Abstract: Based on author's published papers, summarizing some problems that special and general relativity cannot solve or induce wrong results, such as: special twin paradox that two brothers' states of motion are quite same, contradictions between relativity and principle of conservation of energy, and the like. The two main shortcomings of relativity are as follows: firstly, applying mathematical principle (rather than physical principle) as the main principle to solve physics problems; secondly, as establishing relativity, the principle of conservation of energy is not considered. Referring to "partial and temporary unified theory of natural science so far" including all the equations of natural science so far, the related formulas and equations of relativity can be improved and restricted (or constrained) by principle of conservation of energy, and thus these formulas and equations can satisfy the principle of conservation of energy.
Key words: Relativity, special relativity, general relativity, shortcoming, principle of conservation of energy, partial and temporary unified theory of natural science so far

1 Introduction

Since the year of 1920, theory of relativity has been held on a altar. After entering the 21st century, the situation already changed in some cases, Einstein and theory of relativity have started to go down from the altar. An increasing number of scholars point out the defects and shortcomings, even wrong results of relativity.

Based on the papers and the like published by the author, this paper summarizes some problems that special and general relativity cannot solve or produce wrong results

2 Problems that special and general relativity cannot solve or induce wrong results

（1）Special twin paradox that two brothers' states of motion are quite same

As well-known, the phenomenon of "clocks look slower" causes the twin paradox. According to theory of relativity, supposing that there are a pair of twins, the younger brother keeps on the Earth, the elder brother roams through the outer space as a astronaut. As the elder brother returns to the Earth, he will be much younger than his younger brother. The twin paradox means: Because the movement is relative, we also may think that the younger brother is carrying on the space navigation, therefore the younger brother should be much younger than the elder brother. Such two conclusions are mutually conflict.

There are many explanations given by theory of relativity to this twin paradox (some of them even use general theory of relativity to carry on the complex computation), but their basic starting point is as follows: Two brothers' states of motion are different. Thereupon we may make another special twin paradox that two brothers' states of motion are quite same. If the younger brother doesn't keep on the Earth, but the elder brother and the younger brother all ride their respective high speed airships, facing the completely opposite directions to navigate from the identical time and the identical site

with the same speed along a straight line, after a long period they begin to decelerate simultaneously until static, then they turn around to navigate again along the same straight line with the manner of front to front, finally simultaneously return to the starting point. From the younger brother's viewpoint that, according to the theory of relativity, the elder brother should be much younger than the younger brother; Similarly, from the elder brother's viewpoint that, according to the theory of relativity, the younger brother should be much younger than the elder brother. Who is much younger to the end?

With the theory of relativity, how to explain this special twin paradox that two brothers' states of motion are quite same?

This example is taken from reference [1].

（2）The question caused by inertia mass and gravitational mass are equivalent

For a heavenly body moves around the sun, if the sun does not radiate the heat energy, then the principle of equivalence may be correct. But, the sun radiates the heat energy. As the object temperatures are different, then its masses are also different, therefore, the inertia mass under one kind of temperature is not the same as the gravitational mass under another kind of temperature.

Thus it can be seen that, the principle of equivalence at least should be revised as follows: Under the same temperature the inertial mass and the gravitational mass are equivalent.

But another question will be coming, the masses of some objects also could be changed in the electromagnetic field, thereupon the principle of equivalence should be revised again as follows: Under the same temperature and the same electromagnetic field situation the inertial mass and the gravitational mass are equivalent.

To this analogizes, when will such revisions be finished?

This example is also taken from reference [1].

（3）The problem caused by principle of constant speed of light

As well-known, principle of constant speed of light is one of the two basic principles of special relativity. According to this principle, light travels in straight line in vacuum at a speed of c=300,000 km/s.

Now we explain that principle of constant speed of light is wrong, and as light traveling in vacuum, the direction and the value of its speed are all variable. The changing range of its direction is between 0^{o} to 180^{o}, and the changing range of its value is between 0 to 2c (c=300,000 km/s). As for the speeds of other matters (bodies) and particles, the author agrees with Prof. Smarandache's viewpoint that there is not the upper limit of speed in the universe. The hypothesis that there is the upper limit of speed will be contradicted to the principle of conservation of energy.

Because the speed of light is a vector, therefore as discussing that whether or not the speed of light is variable, we should consider two aspects of the direction and the value.

Now we illustrate the speed of light is variable from two aspects of the direction and the value.

Firstly, Einstein also recognized that the speed of light is variable in direction.

Einstein pointed out that, one of the meaningful inferences and conclusions of the

general principle of relativity is: commonly light travels along a curve in gravitational field. Due to the bending of light can only be happened as the speed of light is changing along with the changing of the position, so we have to make this conclusion: the effectiveness of special principle of relativity cannot be considered as endless, the result of special principle of relativity is tenable only in the case that we cannot consider the influence of gravitational field to the phenomenon (such as the light phenomenon).

Einstein said here very clearly that the direction of speed of light is variable in gravitational field, therefore the speed of light is variable.

Immediately a question that Einstein might not consider is appeared: will light be bending only in gravitational field?

But this is not correct. In June, 2007, an article published in science and technology daily and other media reported that, a new material making light to be bended can be applied to produce the invisibility cloak. Although Einstein's research work did not demonstrate that light can be bended in this way, the scientists of Duke University, United States announced a few weeks ago that, they unveiled the mystery of "invisibility cloak", and succeeded in covering an area of 5 square inches of object to avoid for the microwave detection. This material can change the direction of microwave so that it bypasses the object. The researchers of Duke University said that they hope to develop other types of invisibility cloak that can even survive the visible light.

Another very obvious fact is that, when the light is projected to a mirror with an angle that is not equal to zero, after reflecting its direction will be changed. In this case, the changing range of its direction is between 0º to 180º.

Now we discuss the changing range of the value of speed of light.

Let us consider the two rays of light, taking a ray of light as the frame of reference to inspect the speed of another ray of light.

Since we can choose the carriage traveling at speed v on the rail as the frame of reference, it should be allowed to choose a ray of light as the frame of reference.

If taking a ray of light as the frame of reference, when the two rays of light are located on the same straight line and have the same direction (the angle between the two rays is equal to 0º), the speed of another ray of light relative to the first ray of light is equal to zero. When the two rays of light are located on the same straight line and have the opposite directions (the angle between the two rays is equal to 180º), the speed of another ray of light relative to the first ray of light is equal to 2c (c=300,000 km/s). When the angle between the two rays of light is equal to other value, the variation range of the speed of another light relative to the first ray of light is 0 to 2c.

According to the law of composition of velocities, supposing that two rays of light are projected from a single point at the same time (the angle is equal to θ), from the front end photon of a ray of light to observe the front end photon of another ray of light, the speed of the front end photon of another light is as follows

$$V_{Photon} = 2c\sin(\theta/2) \qquad 0 \le \theta \le \pi$$

In other cases, whether or not the value of the speed of light is variable, and whether or not the changing range is still limited in the range of 0 to 2c, these questions are further topics to be discussed.

In addition, for the experimental verification of the principle of constant speed of light, we should say that, all of the experiments are very limited, and a number of factors have not been considered. For example, whether or not the speed of light is variable in the cases that the light is acted by the strong source of heat radiation and the like?

Here, we can point out the wrong results caused by Lorentz transformation.

As we have said, when the two rays of light are located on the same straight line and have the opposite directions, the speed of another ray of light relative to the first ray of light is equal to 2c. But in this case, the Lorentz transformation may give the wrong result that the speed of another ray of light relative to the first ray of light is still equal to c.

This example is taken from reference [2].

（4）The problem caused by special principle of relativity

According to the special principle of relativity, physical laws are the same in *all* inertial reference frames.

If the meaning of "same" is "completely equivalent", then the special principle of relativity has the question in the area of philosophy.

In the world people never find two completely equal leaves. Similarly, it is impossible that physical laws are the same in *all* inertial reference frames.

For any two reference frames (coordinate systems), the descriptions to some physical laws impossibly to be completely same. Regarding the different reference-bodies (or their state of motion), at least we may say, the convenient degrees to describe "the law of nature" are different. That is the reason that the rectangular coordinates and polar coordinates are more universal (or more predominant) than other coordinates.

Especially, if these physical laws refer to the quantity relations, or for the reason that some conditions are different, the descriptions for them may be completely dissimilar.

For example, for the law of sound velocity, we may say that, "On the earth's surface with air temperature is 15℃, the sound velocity is 340m/s."

But, for the airplane flying with the sound velocity, if its flight direction is consistent with the sound propagation direction, then the sound velocity is 0m/s. If its flight direction is opposite to the sound propagation direction, then the sound velocity is 680m/s.

Moreover, for the coordinate systems in vacuum state, among them the sound simply cannot propagate, thus the sound velocity is 0m/s forever. Please note this conclusion, because we can see that this conclusion will cause the Lorentz transformation to induce the wrong result.

The readers may display their own imaginations as far as possible, to find more mistakes about the special principle of relativity.

This part is taken from reference [1].

（5）The problem caused by general principle of relativity

As for the question of general principle of relativity (the principle of general covariance), it does not need us to point out, Einstein himself already revised his original viewpoint. In other words, to withdraw a stride from his originally proposed general principle of relativity (the principle of general covariance).

Einstein pointed out that, the following statement corresponds to the fundamental

idea of the general principle of relativity: *"All Gaussian coordinate systems are essentially equivalent for the formulation of the general laws of nature."*

Here, Einstein already has obviously drawn back a step, from "*All coordinate systems are essentially equivalent for the formulation of the general laws of nature*", drew back to be restricted in "all Gaussian coordinate systems" only.

As for the reason to draw back this step, we cannot find the explanation.

A logical explanation is that the general principle of relativity has encountered the trouble.

Moreover, it also has another question: Why has to draw back to "all Gaussian coordinate systems"? We cannot find the explanation also. A logical explanation is that, because the general theory of relativity used the Gaussian coordinate systems, therefore it could not draw back further.

It is difficult to understand that, Einstein already discarded the general principle of relativity, i.e., "*All coordinate systems are essentially equivalent for the formulation of the general laws of nature*" (or similar statement), but at present it still be used in many textbooks!

Here we present an example to show that *all coordinate systems are not essentially equivalent for the formulation of the general laws of nature*.

As well-known, the fractal distribution reads

$$N = \frac{C}{r^D}$$

The fractal distribution is a straight line only in the double logarithmic coordinates. Therefore, if some law of nature conforms to the fractal distribution rule, then the law that "the change of this natural phenomenon conforms to the linear rule" is only correct in the double logarithmic coordinates.

This part is taken from reference [1].

（6）General relativity cannot solve the problem of advance of planetary perihelion

Although general relativity was used to solve the problem of advance of planetary perihelion, it contains some subjective factors; one of the most critical question is that for planetary motion equation of general relativity, the non-closed and non-symmetric solution is presented deliberately. Similarly, the closed and symmetric solution can also be presented deliberately. In this way, general relativity will be not available to deal with the problem of advance of planetary perihelion, and the new approach should be found.

From reference [3] we can see that, if considering the approximate solution including two terms only, general relativity can reach the better results as solving the problem of advance of planetary perihelion. But considering the approximate solution including more terms, whether or not general relativity can be used to deal with the problem of advance of planetary perihelion? This is a further topic needed to be studied carefully.

In reference [3], referring to the planetary elliptical motion equation given by law of gravity, the closed and symmetric approximate solution for planetary motion equation of general relativity can be taken as follows

$$u = \frac{1 + e\cos\varphi}{p} + b_0 + b_1\cos\varphi + b_2\cos 2\varphi + ...$$

Obviously, it satisfies the following symmetric condition

$$f(\varphi) = f(-\varphi)$$

If the solution for planetary motion equation of general relativity is unique, then the non-closed and non-symmetric solution including infinite terms should tend to the closed and symmetric solution (namely the value of advance of planetary perihelion should tend to be equal to 0).

In reference [4], a new explanation is presented: The advance of planetary perihelion is the combined result of two motions. The first elliptical motion creates the perihelion, and the second vortex motion of solar system creates the advance of perihelion. In the motion of planet-sun system, under the action of law of gravity, the planetary orbit is a closed ellipse, and consistent with the law of conservation of energy. Meanwhile, the planet also participates in the vortex motion of solar system taking the sun as center; the long-term trend of the vortex is the further topic, but in the short-term may be considered that due to the inertia the planetary perihelion will run circular motion in vortex and lead to the advance of perihelion, thus also without acting against the law of conservation of energy. Based on the result of general relativity, the approximate angular velocity of advance of perihelion is given; and based on accurate astronomical observation, the accurate angular velocity is given. Finally the approximate expression for circular velocity of solar system's vortex motion is presented. For ordinary vortex motion the circular velocity is inversely proportional to the radius r, but for solar system's vortex motion, it is inversely proportional to $r^{3/2}$.

（7）The problem caused by mass-velocity relation

For the mass-velocity relation $m = m_0 / \sqrt{1 - u^2 / c^2}$, obviously the most unreasonable result is that when the velocity tends to infinity, the mass also tends to infinity; another unreasonable one is that the velocity cannot be greater than the speed of light.

Some problems of relativity and the unreasonable results can only be seen outside the scope of physics.

Supposing that one apple is placed in universal space, and it is sold by its mass. For the reason that the observations from different planets will get different velocities, namely its mass should have different results; thus, the buyers located on different planets should pay different prices. While, if the astronaut who's flying speed close to the speed of light and he wants to buy this apple, then he should pay a price close to infinity.

On this issue, we can return to the method of Newton mechanics: the mass of a body does not change with its moving speed, but the action (or effect) of this body will change according to its moving speed; and the mass of a body is determined based solely on the number of particles it contains.

（8）Problem can be solved by Newton mechanics but cannot be solved by relativity

There are many problems cannot be solved by general relativity such as a body is forced to move in flat space (for example, a small ball rolls along the inclined plane).

For the problem of a small ball rolls along the inclined plane, although the original law of gravity and Newton's second law can be used to solve it, the result is not consistent with principle of conservation of energy.

In reference [5], solving an example of a small ball rolls along the inclined plane with principle of conservation of energy and deriving improved Newton's second law and improved law of gravity simultaneously with the forms of constant dimension fractal and variable dimension fractal. The results are as folows.

The improved law of gravity with the form of constant dimension fractal is as follows

$$F = -\frac{GMm}{r^{1.99989}}$$

The improved Newton's second law with the form of constant dimension fractal is as follows

$$F = ma^{1.01458}$$

For the results of variable dimension fractal, supposing that the improved Newton's second law is as follows: $F = ma^{1+\varepsilon}$, $\varepsilon = k_1 u$; the improved law of gravity is as follows: $F = -GMm/r^{2-\delta}$, $\delta = k_2 u$; where, u is the horizon distance that the small ball is rolling.

After determining the values of k_1, k_2, we get the results of variable dimension fractal as follows

$$\varepsilon = 8.779\times10^{-8}u\,,\quad \delta = 1.206\times10^{-12}u$$

The results of variable dimension fractal are much better than that of constant dimension fractal.

（9）Whether or not the field equations of general relativity can be derived without Newton's law of gravity

As establishing the field equations of general relativity, through a series of mathematical derivation, ultimately it has to rely on Newton's law of gravity. While the law of gravity is not consistent with the principle of general covariance. Whether or not the field equations of general relativity can be derived without Newton's law of gravity? Nobody can answer this question so far.

Relying on Newton's law of gravity to establish the field equations of general relativity, also face a problem: If Newton's law of gravity is improved, whether or not the field equations of general relativity should be rederived according to this improved law or formula?

This question has now become further research topics, because there have been improved Newton’s universal gravitation formula and the like.

For example, in reference [5], the following improved Newton’s universal gravitation formula is presented

$$F = -\frac{GMm}{r^2} - \frac{3G^2M^2mp}{c^2r^4}$$

where: G is gravitational constant, M and m are the masses of the two objects, r is the distance between the two objects, c is the speed of light, p is the half normal chord for the object m moving around the object M along with a curve, and the value of p is given by: $p = a(1-e^2)$ (for ellipse), $p = a(e^2-1)$ (for hyperbola), $p = y^2/2x$ (for parabola).

This improved Newton's universal gravitation formula can give the same results as given by general relativity for the problem of planetary advance of perihelion and the problem of gravitational defection of a photon orbit around the Sun.

For the problem of planetary advance of perihelion, the improved Newton's universal gravitation formula reads

$$F = -\frac{GMm}{r^2} - \frac{3G^2M^2ma(1-e^2)}{c^2r^4}$$

For the problem of gravitational defection of a photon orbit around the Sun, the improved Newton's universal gravitation formula reads

$$F = -\frac{GMm}{r^2} - \frac{1.5GMm_0^2}{r^4}$$

where： r_0 is the shortest distance between the light and the Sun, if the light and the Sun is tangent, it is equal to the radius of the Sun. The funny thing is that, for this problem, the maximum gravitational force given by the improved Newton's universal gravitation formula is 2.5 times of that given by the original Newton's law of gravity.

（10）Contradictions between relativity and principle of conservation of energy

Based on the special theory of relativity, if a photon (or a particle with speed of light) is moving in the gravitational field of the Sun, its kinetic energy does not change, but its potential energy should change according to the distance being apart from the Sun, thus it is contrary to the principle of conservation of energy.

Based on the general theory of relativity, the orbit of a planet such as mercury is non-closed, whether or not this is contrary to the principle of conservation of energy, it is still an unsolved problem.

3 Main shortcomings of relativity

The two main shortcomings of relativity are as follows: firstly, applying mathematical principle (rather than physical principle) as the main principle to solve physics problems; secondly, it does not consider the principle of conservation of energy.

If mathematical principle can be used (instead of physical principle) as the main principle to solve physics problems, mathematicians will dominate in physics and almost all scientific fields. But this is clearly not possible.

In the field of physics, mathematics is only a tool. Applying mathematics to command physics, rather than applying physics to command mathematics, that is the most misleading of Einstein to physics. Because of this misleading, except a few success, we

do not know how many times and energies of outstanding people (including Einstein himself) were wasted.

According to reference [7]: so far only the “law of conservation of energy” can be considered as the unique truth in physics. As for other “laws”, they are correct only in the cases that they are not contradicted with law of conservation of energy or they can be derived by law of conservation of energy; otherwise their probability of correctness should be determined by law of conservation of energy or experiment (currently for the most cases the correctness can only be determined by experiment). Besides law of conservation of energy, all other laws of conservation in physics may not be correct (or their probabilities of correctness are all less than 100%). In addition, the essential shortcomings of special relativity and general relativity are caused from the reason that law of conservation of energy was not considered at the established time of these two theories; therefore the results of relativity will appear the examples contradicted with law of conservation of energy, and in the area of general relativity the attempt to derive the correct expression of energy will never be successful.

4 Applying principle of conservation of energy to improve and restrict (or constrain) the related formulas and equations of relativity (such as the field equations of general relativity)

Referring to references [2, 6] for applying least square method to establish "partial and temporary unified theory of natural science so far" including all the equations of natural science so far (in which, the theory of everything to express all of natural laws, described by Hawking that a single equation could be written on a T-shirt, is partially and temporarily realized in the form of "partial and temporary unified variational principle of natural science so far"), the related formulas and equations of relativity can be improved and restricted (or constrained) by principle of conservation of energy, and thus these formulas and equations can satisfy the principle of conservation of energy.

The general form of the principle of conservation of energy is as follows

$$E(t) = E(0) = c o n s$$

or

$$1 - \frac{E(t)}{E(0)} = 0$$

Einstein’s field equations of general relativity can be written as follows

$$R_{a\,b} - \frac{1}{2} R\, g_{a\,\overline{b}} = \kappa\ T$$

Applying principle of conservation of energy to improve and restrict (or constrain) the field equations of general relativity, it gives the following variational principle

$$\Pi = \int_{\Omega} F^2 d\Omega + w \int_{t_1}^{t_2} (1 - \frac{E(t)}{E(0)})^2 dt = \min_0$$

where， $F = R_{ab} - \frac{1}{2} R g_{ab} - \kappa T_{ab}$， $\min_0$ indicates the minimum and its value should be

equal to zero; w is a suitable positive weighted constant.

As applying principle of conservation of energy to improve and restrict (or constrain) other related formulas and equations of relativity, the similar method can be used.

5 Conclusions

This paper discusses some problems that special and general relativity cannot solve or induce wrong results. Certainly, this doesn't mean that, the special theory of relativity and general theory of relativity are completely wrong. For some questions, the special theory of relativity and general theory of relativity also may produce the correct conclusions or the approximate results [1]. Before relativity can be replaced, referring to "partial and temporary unified theory of natural science so far", the related formulas and equations of relativity can be improved and restricted (or constrained) by principle of conservation of energy, and thus these formulas and equations can satisfy the principle of conservation of energy.

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