

Form space: a new understanding of space in the theory of relativity

[Shorter] Form Space in the Theory of Relativity

Runsheng Tu

National Special Steel Quality Products Supervision and Inspection Centre, P. R. China.

Abstract

What is the physical mechanism by which space contracts due to motion? Theory of relativity is reluctant to answer this question. The reason is that this physical mechanism threatens the principle of relativity. The side effects of theoretical mathematical formal system have not been reported. This side effect is mainly the proliferation of mathematical formal concepts (and/or conclusions) that violate mathematical logic and do not correspond to facts. Through a series of thought experiments, it reveals the spatial difficult related to concept proliferation that have never been reported in the special theory of relativity — There is a logical contradiction in the concept of "when mutual observation, always is observed ruler shortening". The existence of such contradictions or spatial difficulties is a side effect of the above. According to the relation of mass-velocity of relativity and quantum mechanics, the conclusion that the moving object shrinks in all directions due to the motion is deduced. Deeper understanding of space time is provided and it is exposed that the areas of further research topic on the space time continuum and their role in the proper understanding of relativity theory.

Keywords: Mathematical formal system of physics theory; Concept proliferation; Formal space; Spatial paradox; Negative effect of mathematical formal system, Difficult of spatial contraction mechanism.

Everyone says that the theory of relativity brings humans' understanding of time and space to a higher level (from Newton's absolute space-time view to Einstein's relative space-time view). Einstein's theory describes the variable characteristic of time and space. It does not properly expose the essence of time and space. Does the space related to time mean that the mathematical space described by x , y and z in the mathematical equation is related to time, or does it mean that the volume of moving objects is related to time? Until now, this issue is still confusing. Many people pointed out some problems in the theory of relativity, and many of them strongly protested the problems in the theory of relativity [1-5]. It can be said that the problem of relativity (especially the

spatial paradox) is still not treated correctly. Most of these people did not realize the transitional and long-term nature of theoretical development (during the transitional period of theoretical development, part of the content of the mathematical formal system that allows the theory to be inconsistent with the facts). Mankind's understanding of time and space will certainly continue to deepen. This article will explore the essence of the space-time view in the framework of special relativity. At the same time, it discusses the shortcomings of the time-space view of the theory of relativity, and demonstrates why we should tolerate these shortcomings. **It is concluded that "space in relativity can sometimes only be understood as formal space"**. As long as it is admitted that Einstein's understanding of time and space is an improvement, it must be admitted that this article is also an improvement in the understanding of time and space. The mistake people make is to regard the mathematical form space required by the mathematical formal system as a real space consistent with facts.

The mathematical formal system itself can derive some concepts. There is no perfect person in the world. We cannot reject or even execute a person because of his shortcomings. Theories are the same as people, and there is no perfect theory (otherwise, the theory will develop to the end and cannot continue to develop). Only the ultimate theory has no shortcomings and does not need development. But the ultimate theory does not exist. As long as any theory has practical value, we should tolerate its shortcomings. In order to ensure the integrity and logical rigor of the physics theory system, it is generally necessary to establish a rigorous mathematical formal system for the physics theory. The mathematical formal system of the theory itself can derive some concepts. Hilbert space and Minkowski four-dimensional space are both typical mathematical spaces (**no one can draw more than three-dimensional spatial coordinates**). The concept of mathematical form that can directly or indirectly derive results consistent with facts is a concept of beautiful mathematical form. The rigor of the mathematical formal system of the theory is not always consistent with the conformity between the theory and the facts. **The solutions of even degree equations often contain meaningless accretive solutions. Similarly, mathematical equations or mathematical operations can also proliferate physical explanations that do not conform to facts — mathematical form concepts, explanations, or conclusions (for short, form concepts). It is more likely to proliferate concepts of mathematical form from an imperfect system of physical theory. We can call the**

formation of mathematical form concepts conceptual hyperplasia. Formal concepts are unrealistic (virtual) concepts.

As mentioned earlier, the theory of relativity has a strict mathematical formal system, but this does not guarantee that the theory of relativity does not deviate from the actual shortcomings (not to mention that it does not have mathematical logical contradictions). The theory of relativity is superior to the previous similar theories, and the theory that replaces the theory of relativity has not yet appeared (or has appeared, but has not yet been recognized [6-9]). Since the theory of relativity still has practical value, we have to temporarily tolerate some of its shortcomings. There are many people who criticize the theory of relativity (including the view of time and space in the theory of relativity). They pointed out many contradictions in the theory of relativity. One category of people does not admit that there are contradictions in the theory of relativity. Another type of people totally **denies** the theory of relativity because of the contradictions in the theory of relativity. The former is obviously paranoid because of emotions, interests, or beliefs. The latter is a perfectionist.

The following will point out some contradictions of special relativity that have to be tolerated, especially the paradox of space (these contradictions have never been reported). This is conducive to our better understanding of relativity and a more dialectical view of relativity.

The core of the mathematical formal system of special relativity is the Lorentz transformation (or Minkowski's four-dimensional space geometry). The core of the mathematical formal system of general relativity is Einstein's field equations. "Space shrinks due to movement", "The result of each other's observation is the contraction of the observed party's ruler", "simultaneous relativity", and "space bends due to mass" are the conclusions derived from the mathematical formal system of the theory of relativity. **We will judge whether the two conclusions of special relativity are ugly mathematical conclusions by examining the first two conclusions.** As long as the conclusion that "space shrinks due to movement and this shrinkage is relative" can lead to mathematical logic contradictions (or inconsistent with the facts), **this contradiction is the spatial knotty of special relativity.** There are countless people who point out the contradictions in the theory of relativity, so that orthodox physicists suffer from serious "aesthetic fatigue." Space difficulty is a new contradiction in the special theory of relativity. Revealing it can arouse readers' interest and increase readers' knowledge (improve readers' awareness of space).

Fighting and walking on the roof of the car are exactly the same as the movement in the car, and the mathematical form of the laws of mechanics is exactly the same. This is the foundation of Galileo's principle of relativity and Einstein's principle of relativity. The space of the inertial system of a train moving at a constant speed is not limited to the compartment (note: space refers to vacuum). A certain distance around the car is also its spatial range. The theory of relativity does not provide a method to divide the space boundary of the motion system. Therefore, this spatial range can only be infinite. If the space of the motion system is limited, there must be a way to divide this space boundary. This is the concept of space belonging and space scope of Galileo's principle of relativity and Einstein's principle of relativity. Adhering to this concept is equivalent to admitting that "the movement of a small object is accompanied by an infinite space that moves with it." However, there is no reliable physical mechanism for a small object to move an infinite space with it. This view of spatial belonging is just a choice in the sense of mathematics. However, some correct conclusions can be drawn based on this view of spatial belonging and spatial scope (Note: Not all derived conclusions are correct. This shows that the scope of application of the theory of relativity is limited). In other words, not all ugly mathematical concepts are unavailable.

The motion in the special theory of relativity refers to the relative motion between frames of reference. Described in mathematical language, the reference system is the coordinate system. The mathematical form space in special relativity is the collection of points in the coordinate system. The range of the space coordinate system is infinite. It can be seen that the space described by the mathematical formal system of special relativity is a system composed of an infinite number of points arranged infinitely in three mutually perpendicular directions, and its range is infinite. There are several difficulties in the relative movement of two infinite spaces: first, there is no place for them to move in the infinite space; second, there is no mechanism for two infinite spaces to intersect each other. For the special theory of relativity, in the space connected with the moving object, the movement of the point outside the object can only be a mathematical motion.

There are logical problems with the movement of empty space and the movement of infinite space. The movement of space without a thing belongs to the movement of nothing. There is no gap for infinite space to move, and infinite space can only be absolutely static. The absolute motion of infinite objects (including infinite space) has no meaning. In the space-time view of relativity (especially the concept of space

range), there are countless overlapping infinite spaces in the universe, and there are relative motions between these infinite spaces. Each motion system corresponds to an infinite space, and these infinite spaces move in a staggered manner. The covariance of the laws of physics requires a moving object to move with an infinite space. This is the recognition that space is subordinate to objects. In the universe, there are many objects in different states of motion, but there is only one infinite space. It can be seen that there are logical problems in the relative motion between infinite spaces and the spatial attribution division method of relativity. Because an infinite space can only belong to one object, and the space associated with other moving objects can only be a fictional space — formal space. If the space that a moving object can drive is a limited space, it violates the universality of the principle of relativity — the covariance of the laws of physics has nothing to do with the location of the event. In addition, the theory of relativity cannot provide a method of manufacturing spatial motion. If we admit that objects are embedded in space, accelerating objects is not the way to create infinite space motion.

If "let the still space move and let the space of motion rest" cannot be done, what else can we talk about in practice utilizing the space contraction characteristic due to motion? If the relative motion of space is derived from the movement of the observer, then all the moving spaces are the same infinite space. We cannot determine the contraction center of infinite space contracted by motion. As mentioned above, it is recognized that the space to which the motion system belongs is infinite, and there is a problem of "no gap for infinite space displacement"; Acknowledging that the movement system only occupies a small space, there is the problem of "a small space moves in a large space, that is, space moves in a space". If the space really shrinks due to movement, the center of shrinkage of the infinite space cannot be determined (It's definitely not the midpoint of the object that drives infinite space to move). It can be seen that the concepts and inferences in the theory of relativity—"space movement" or "space shrinks due to movement"—have insurmountable logical problems. What has been revealed above is the difficulty of spatial movement in the theory of relativity.

There is a moving light source s and an observer O_A in inertial frame A . The light source emits a photon. If you observe this photon in system a , you must think that it is emitted by a moving light source, but it is a particle moving in space in system A . According to the principle of relativity, the observer O_b in the inertial system B associated with the light source s believes that the photon is a particle moving in the space in the B system. It can be seen from this example that the division principle of affiliation of space in relativity theory is "whoever observes, the space belongs to whom". The fact is that the photon moves in the same space, that is, it can only move in one space, not in two different spaces at the same time. The division principle of affiliation of space in relativity theory must use virtual space, that is, the concept of unreal space. The division principle of affiliation of space in relativity must use virtual space, that is, the concept of unreal space.

A specific example is when, in explaining the relativity of the extended lifetime of a Muon (μ) projecting toward the earth's surface, the maintainer of relativity admits

that “observers on the ground believe that the space between the ground and the μ belongs to the ground system.” When observed on the μ , the experimental phenomena conform to the principle of relativity only if the space between the μ and the ground is still considered to belong to the surface system. This is to say that the volume of space belonging to the μ is only the size of the μ , not the infinite space belonging to the μ . In countless examples of sports trains, when observing on a train, space is considered to belong to the train system. That is, adhere to the principle of “space belongs to whoever observes it.” However, this principle has been discarded in interpreting the μ life test. This is the chaotic state to divine the affiliation of space in special relativity.

If there is an unreal situation in space, there will be an unreal situation in speed, and special relativity will expose more problems.

In nature and production practice, the motion of the inertial system is obtained through acceleration, and there are no objects and systems that are always in a state of uniform linear motion. If the space contraction center of the accelerated motion system is not discussed, the application of the special theory of relativity will be restricted and the theory will be incomplete.

The above reveals the problems of spatial attribution and spatial motion in special relativity. Space ownership and space movement are inseparable. One has a problem, and the other must have a problem. Here are a few thought experiments to illustrate the existence of space paradox (belonging to the category of logical problems or logical contradictions) that people rarely think of in the special theory of relativity, and to prove that the space in the special theory of relativity is an ugly mathematical form of space. The reasons why we tolerate the existence of these contradictions are: The mathematical formal system of the special theory of relativity is neither all right nor all wrong; A better alternative theory has not appeared, and the special theory of relativity still has practical value.

1. Observe the accelerating wheel train in the inertial system

There is a straight line on a roadbed system. There are two separate four-wheel drive locomotives on the railway. The length of each locomotive is 16 meters, the distance between the front and rear wheels is 8 meters, and the distance between the two locomotives is 40 meters, The minimum distance between two wagons. That is, the gap between the two locomotives is 24 meters. The ratio of this gap to the length of the locomotive is $24:16=3:2$. This is the situation when the locomotive is stationary in the roadbed system. The two locomotives start at the same time, they reach the same uniform linear motion state from a static state at the same time, and the final speed is $0.866c$, and then keeps this speed forward. The acceleration and speed of the

eight wheels in the two locomotives are always exactly the same. If it is true that the space (or ruler) shrinks due to movement, then the carriages will continue to shrink during the acceleration of the two locomotives.

In this example, the train is continuously accelerating, and the train should be continuously contracting. The continuous shrinkage of the train involves the center of shrinkage (or shrinking direction). Because the process of space contraction is the same as the process of object contraction, which is composed of countless points of movement, and the movement of points must have a direction of movement. Space contraction must clarify the center of contraction, or the direction of contraction, that is, the direction of contraction movement of the space point. In a system that continues to accelerate, time also continues to accelerate expansion. But the continuous expansion of time does not have the problem of the center of time expansion. Time is an amount of intensity. Time dilation is not constituted by the movement of points. In this example, the two locomotives have independent power. Only the acceleration and the acceleration starting point and the acceleration direction are the same. Someone might not hesitate to say that the bodies of the two accelerating trains shrink toward their respective centers. Similar to the situation in **Figure 1b**: the space between the two locomotives belongs to the roadbed system. The same system has multiple shrinkage centers. This is a hasty conclusion. Because these two locomotives are always connected to the same system, they contraction due to movement can only have one center of contraction, and the center distance between them will change due to the shrinkage of the system. This is the problem brought about by narrow relativity.

According to classical physics, the distance traveled by these two locomotives with independent power systems are all $0.5at^2$, and the distance between them should always remain the same. They are associated with the same acceleration system, and they are associated with the same inertial system when acceleration is stopped. Considering this connection, the contraction pattern of the two locomotives in this example is similar to that in **Figure 1c**, that is, the gap between the two locomotives belongs to the train system and the two locomotives share a contraction center. Unfortunately, there is no such thing as space contracting by movement in this classical conclusion. The center distance between two locomotives does not change with their accelerated motion. For uniformly accelerated motion, $S=0.5at^2$ is not questionable, and the conclusion of narrow relativity is questionable.

The inference that "space shrinks due to movement" has its own logic problems. Because empty space impossible completes the behavior of "movement", and movement without matter equals no movement. The statement that "space is full of field matter or space is full of virtual particle pairs" can only mean that space is occupied by field matter, but not that space is the field matter (or virtual particles) themselves. In other words, the movement of field matter in space does not represent space movement. Even if space is considered to be a special matter, infinite space matter can only exist independently and can only be absolutely static. The movement of ordinary matter in infinite space cannot carry such overall movement and partial movement of the infinite space. In other words, in fact, the space occupied by a moving object is not the space of the system corresponding to the moving object. At most, it can only theoretically assume that the space occupied or enclosed by an object is the space of the system related to the object under certain specific occasions. This is different from the view of space belonging in the theory of relativity. The theory of relativity believes that the movement of space moves with the matter embedded in the space. This article believes that the movement of matter in space is the change of the position of the space occupied by the matter. It can be seen that the question of relative movement of space is also a question of space attribution. If space contraction is a visual effect, then time expansion can only be a visual effect. Time dilation cannot be accumulated. Because, it can be said that "space contraction, time expansion, and simultaneous relativity" **can be derived from the Lorenz transformation.**

It is obvious and easy to see, using the principle of relativity, there are some contradictions in the above situation.

Second, we now replace the two four-wheel locomotives mentioned above with eight self-powered unicycles. They are listed as a team on the monorail, and the distance between adjacent wheelbarrows is 50 meters. The distance between the center of the front wheelbarrow and the last wheelbarrow is 350 meters. Other conditions remain unchanged (See **Figure 1a**). **Observing** in the roadbed system, this wheelbarrow has the following shrinkage methods to choose from: First, the wheels shrink while the length of the queue does not change; second, the wheels and the length of the queue shrink in the same proportion. **Observing in a roadbed system, the space outside the wheels belongs to the roadbed system, and each distance traveled during acceleration in this group of wheels is a definite integral of the product of**

translation acceleration and t over time (the result is $0.5at^2$). The distance between the wheels does not change. The result of this calculation that is most in line with the real situation is obviously the first case above. The length of the queue and the center distance between adjacent wheels in this team of wheelbarrows is always the same (See **Figure 1b**). However, when we connect the team of wheelbarrows with a thin wire, and the connection point is at the center of the wheel, and this thin line is too fragile to affect the operation of each wheel. According to the theory of relativity, the team of wheelbarrows becomes a whole (belonging to the same system). After the acceleration is over, the distance between adjacent wheelbarrows will definitely be reduced to half of the original, and the distance between the front wheel and the last wheel will shrink to 175 meters. That is the second case above (See **Figure 1c**). The function of this thin thread is in line with theory but divorced from reality. It must cause the wheels to slip on the rails. In theory, it changes the space ownership between cars — once a thin line is tied between the car and the car, the gap between the car and the car is separated from the roadbed system and belongs to the unicycle system. In reality, this is impossible.

After the acceleration of this team of wheelbarrows is over, is the distance between the center of the first wheelbarrow and the last wheelbarrow 350 meters or 175 meters? The inferred result of the theory of relativity is 175 meters, but it violates the objectivity, authenticity and reality of "the rolling distance of mutually independent wheels is equal to the product of the number of turns, the diameter of the wheel, and π ". Because of this conclusion, it must be admitted that during the acceleration of the train fleet, the shrinkage of space has a strong force to drag the wheelbarrow closer to the center. The total distance between the front and the rear wheels sliding on the rail is 175 meters. The wheels need to overcome friction when sliding on the rails. If there is no space contraction force, the friction force between the wheelbarrow and the rail cannot be overcome and slip. Relativity cannot give this kind of space contraction force; it can't find its source and physical mechanism, so it can only deny its existence. But in reality, the existence of this force is needed. The idea that space contraction causes the objects embedded in it to contract without requiring force is obviously a purely theoretical conjecture, and contradicts the principle of relativity that "the laws of physics in different inertial systems are in exactly the same form". See the example of continuous shrinkage of hexahedral ionic compound due to movement. The law of electromagnetic interaction between point charges is different in the vertical and

horizontal directions. Originally, only talking about the result of change without talking about the physical mechanism of change is one of the Achilles' heels of the theory of relativity. In this example, the weakness is most prominent. Someone must say that when the space shrinks, the objects embedded in the space will shrink without additional compressive force or attractive force. But this will directly negate the objective law of "when the object shrinks, the force between the particles in it also changes." The electric charge of the particles in the moving object does not change. In the hexahedral ionic compound, the distance between two adjacent ions in the longitudinal direction is shortened, and the distance between the ions in the transverse direction remains unchanged. At this time, if the interaction of ions in the lateral direction conforms to Coulomb's law, then the interaction of ions in the longitudinal direction does not conform to Coulomb's law and vice versa. The theory that leads to the applicability of Coulomb's Law in relation to direction must be problematic.

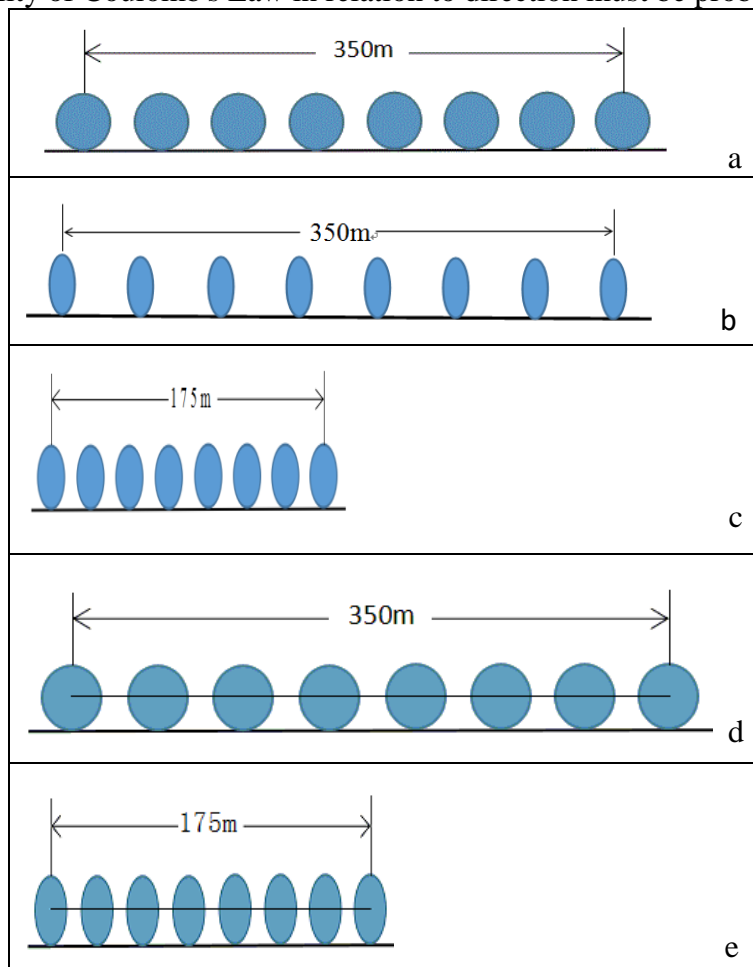


Figure 1. A team of wheelbarrows accelerates from a standstill. (a) Stationary wheelbarrow queue. (b) Each wheelbarrow shrinks due to acceleration, but the length of the queue does not change. (c) The wheelbarrow queue as a whole shrinks due to movement. (d) The stationary state of eight

wheelbarrows connected by thin lines. (e) The state of the eight wheelbarrows connected by thin lines after the entire contraction due to movement.

Now, we use a thin wire to connect the above 8 wheelbarrows, the connection point is on the axle (Shown in **Figure 1d**), and other conditions remain unchanged. At this point, according to the special theory of relativity, it can be said with certainty that the shrinkage of this team of wheelbarrows is that the length of the wheels and the queue shrink at the same time (Shown in **Figure 1e**). If there is no shrinking force that causes the wheels to slide on the rails, conditions c and e will not appear (still observed in the roadbed system). This force must be provided by the so-called fragile thread. If the tension that the thin line can withstand is very small, what will happen? Will the contraction of the fleet length deviate from the prediction of the theory of relativity? In other words, if situation e must occur, it must be admitted that space contraction due to movement requires contractile force (or contractile force exists). This is in contradiction with the principle of relativity. The existence of the space contraction force corresponding to the frictional force mentioned here is absolute.

If there are passengers on the wheelbarrow shown in **Figure 1d**, they can observe and have an overall knowledge of what they have observed. Otherwise, general relativity has no application value. If you observe on the wheelbarrow shown in **Figure 1d**, the connecting line should play a role in supporting the team. For adding a fragile connecting line, its actual effect will never be great, but its theoretical effect is very great. If the movement of the wheels cannot move together with the space between the wheels, the unicycle has multiple contraction centers before the thin line is added, but after the thin line is added, the unicycle has only one contraction center. The effect of thin lines should not be so great. Some people may say that special relativity recognizes that a moving object moves always carrying the infinite space around it. However, this understanding must recognize that there are many infinite spaces in our universe, and it must be admitted that accelerating an object is equal to accelerating an infinite space. There is only one real cosmic space, in which there are multiple overlapping infinite spaces, which can peel off each other without friction. There is only one real cosmic space, in which there are multiple overlapping infinite spaces, which can peel off each other without friction. There is no doubt that there are logical problems and "inconsistent with reality" (that is, there is the suspicion of fictional space). Considering this factor, we should take seriously the scholars who criticize the special theory of relativity and their remarks.

It is not difficult to see that even if the principle of "Whoever observes, the space belongs to whom" is adhered to, whether the total length of the team is shortened or unchanged cannot be judged correctly. Observed in the roadbed system, the space between the front and rear wheels should belong to the roadbed system. That is, observing in the roadbed system, the eight unicycles move in the space in the roadbed system respectively, and the wheels become flat, but the total length of the fleet remains unchanged. If the observation in the roadbed system also insists that the space between wheels belongs to the train system, the division of spatial subordination is even more chaotic. If only the object shrinks due to motion, the space between wheels does not shrink, and the space belongs to the roadbed system, the above problems do not exist. This case revealed a central difficulty with spatial shrinkage in the setting of spatial shrinkage difficulty. It is pointed out that there are logical problems in the conclusion of "space shrinks due to motion". This difficult and logical problem can be eliminated by using the viewpoint of "object shrinks due to motion".

2. Observe the umbrella rotating at high speed

"In the same system, the movement distance of a point = the product of the movement speed of a point and its movement time" is a mathematical law. The credibility of this law is higher than that of the special principle of relativity.

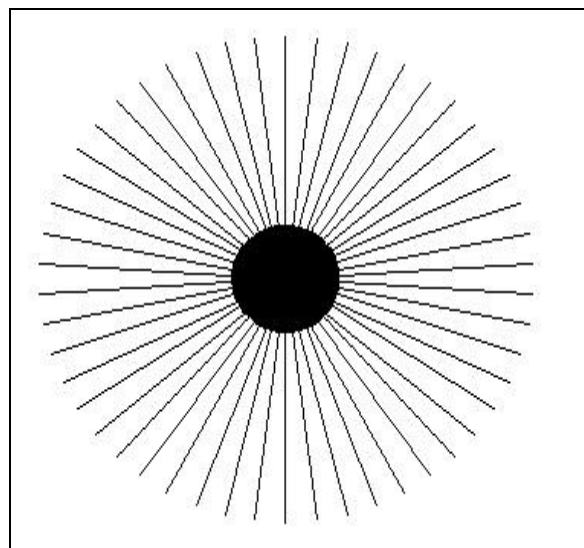


Figure 2. The ribs of a flat umbrella. When the umbrella rotates at high speed, if the clock slow scale effect is true, the skeleton plane of the umbrella will not pot, but the umbrella plane with umbrella cloth will pot. Unless the whole space also rotates with the umbrella, there is no such difference. There are many galaxies in space that cannot rotate with the umbrella.

An umbrella is spinning at high speed. Assuming that this umbrella is a standard plane after it is opened (Shown in **Figure 2**). According to the special theory of relativity, the bell shrinks slowly, the edge of the umbrella shrinks, and the relationship between the umbrella diameter and the circumference does not conform to the law of π . That is, the circumference deviates from the product of diameter and π . If we only consider the trajectory of the end of the rib of such an umbrella, the relationship between the length of this trajectory and the length of the rib must conform to the law of circumference. Circumference is equal to the product of diameter and π . The conclusion based on the point's trajectory contradicts the conclusion based on the theory of relativity. What happens if the canopy falls off during high-speed rotation and the ribs remain? According to the theory of relativity, this question cannot be answered accurately. The reasons are as follows: at this time, the circumference of the circle drawn by each point must be calculated according to the motion trajectory of each point on the umbrella plane; The circumference of a circle drawn in a relatively static space will not shrink relativistically; The umbrella surface and the surfaces spliced by these circular trajectories must overlap (because these circles are drawn by the points of the umbrella surface); As long as the circumference of these circles does not shrink, the umbrella surface does not shrink.

In short, when the umbrella rotates in the laboratory system, the space between the umbrellas belongs to the laboratory system, and the umbrella plane of the rotating umbrella will not sag. When the space between the umbrellas is considered to belong to the rotating umbrella system, the umbrella plane of the rotating umbrella will sag. When the umbrella has only one umbrella bone, the plane drawn by the points on the rotating umbrella bone will not sag. When the umbrella has multiple bones and the space between the umbrella bones belongs to the umbrella bone system of transport, the umbrella plane of the transport umbrella will sag. Who is right and who is wrong? Relativity has no definite judgment.

For a circular plane, when the shrinkage of the place with large radius is higher than that of the place with small radius, the plane will inevitably become deformed or split. If neither deformation nor cracking is observed, the contraction can only be a purely theoretical prediction, not even the apparent visual effect.

This example reveals the difficulty of non-uniform shrinkage in the difficulty of space shrinkage. Like the previous section, this section is to expose the contradiction of space contraction due to movement, the problem of space ownership, and the problem of accelerating space. No experiment on earth can accelerate an infinite

space. As long as we believe that objects contract due to motion and space cannot be accelerated, the contradiction in this section will be eliminated.

3. Observe that objects falling into the inclined pit expand due to deceleration

There is an inclined pit with an outlet length of 4.2m on the ground and a metal plate with a static length of 8 meters in the air. The board falls diagonally into this pit at a very high speed (the lateral velocity component is $0.866c$. See **Figure 3** for details). After the metal plate falls into the pit, the air pressure in the pit can slow down the plate until it stops sliding. According to the inference of the theory of relativity, the length of the moving metal plate shrinks to half of the original length (that is, shrinks to 4 meters). When it falls into the pit and suddenly stops moving, its length will expand relatively. This is the reverse process of an object contracting due to motion. When it expands relatively to fill the 0.2 meters, it will continue to expand and impact the pit walls on both sides. What is the source of this expansion force (how is it formed)? The theory of relativity cannot answer this question.

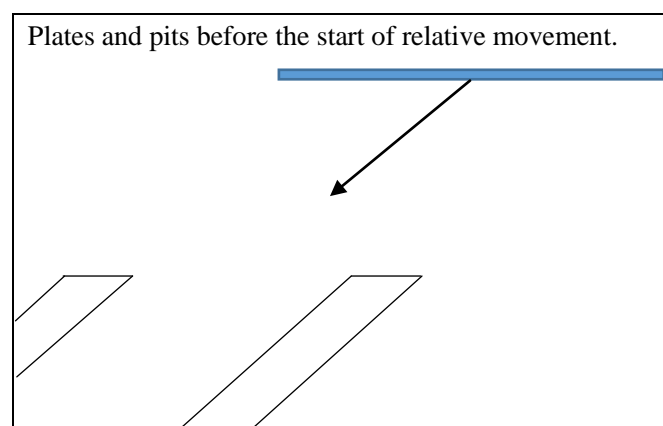


Figure 3. Observation in a relatively static system, a metal plate moving diagonally falls into the pit.

The principle of relativity shows that although an observer believes (or even can see) that a moving object shrinks due to motion; the observer on this object cannot feel the contraction of himself and the objects around him. It can be seen that the principle of relativity must adhere to the viewpoint that "space shrinks due to motion and does not need the action of force". Since an object shrinks because of motion, a moving object must expand when it stops moving. If such expansion has expansion force, the corresponding contraction also has contraction force, unless it is recognized that such contraction and expansion are both apparent. How is the expansion force of this kind of expansion released? What is the mechanism of this kind of contraction and expansion? Theory of relativity never discussed these problems, nor could it.

According to the judgment principle of special relativity, the observer in the ground system and the observer stationary on the metal plate "cannot reach an agreement on whether the metal plate falls into the pit".

The problem exposed by this example is that there is a logical problem in "the relativity of the contraction of objects due to motion". Denying the relativity of object contraction due to motion can eliminate the contradiction revealed in this section. Observing on the ground, the metal plate can fall into the pit. Observed on the metal plate, the pit mouth is shortened, and the metal plate can not fall into the pit. Relativity can't solve the contradiction in any way. Therefore, this example also reveals the spatial difficulties of relativity.

So far, we know that special relativity has several difficulties in describing space: The motion of space and the mechanism of motion state change; the contraction center of space contraction; the relativity of space contraction. Some people insist that the contraction of space due to motion can be observed. However, what the experiment detects is that the object shrinks due to motion, not space shrinks due to motion. The reason is that it is impossible to accelerate space. I've never heard of anyone successfully accelerating the vacuum. Since space cannot be accelerated, the motivation of space can only be God, and the movement of space will be disconnected from the movement of objects. It can be seen that the view that "space can move" is not rigid enough.

4. Observe the thin plate with oblique perforated holes in the inertial system

Change the pit in the above example (case 3) to a bottomless pit, that is, it becomes a frame (See **Figure 4** for details). Other conditions and status remain unchanged. Observing from the ground, the thin plate moving diagonally can pass through this bottomless pit. However, looking at the moving thin plate, because the length of the pit shrinks more than the length of the thin plate (the length of the pit is originally smaller than the length of the thin plate), the thin plate cannot pass through this bottomless pit. The special relativity principle and the inference of the ruler shrinking due to motion have entered a dilemma, which constitutes the ruler contraction paradox. The solution is still to recognize that "the shrinkage of space due to motion is only the need of the mathematical formal system of special relativity."

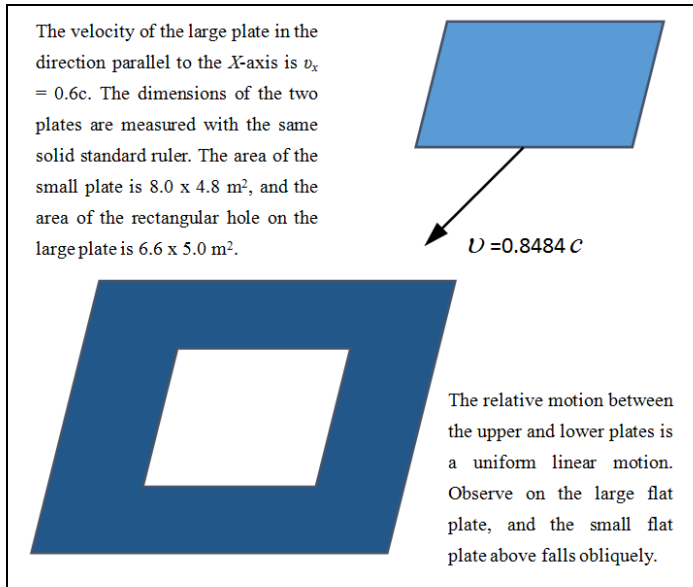


Figure 4. The space difficult. When observed on the large plate, the small plate can pass through the rectangular hole on the large plate, but observing the small flat plate, it doesn't. The law of refraction is broken.

The problem exposed by this example is also that there is a logical contradiction in "the relativity of the contraction of objects due to motion". Denying the relativity of object contraction due to motion can eliminate the contradiction revealed in this section.

5. From the contraction mechanism of moving hydrogen ruler to the relativistic effect of volume

The orbital radius of Bohr ground state hydrogen atom is

$$a_0 = \frac{\epsilon_0 \hbar^2}{\pi m e^2} = \frac{\hbar \alpha}{m c} \quad (1)$$

Here, m is the mass of the electron. As the hydrogen atom moving, the electron mass increases according to the relativistic relationship of mass-velocity. — Eq. (2)

$$m = m_0 / \sqrt{1 - (v/c)^2} \quad (2)$$

There is a ruler made of solid hydrogen. When it moves, the radius of the hydrogen atom in it decreases by $\sqrt{1 - (v/c)^2}$ times. The size of hydrogen molecules and the distance between molecules also decrease by the same multiple. In this way, the hydrogen ruler will shrink B times due to movement.

$$V = V_0 \sqrt{1 - (v/c)^2} \quad (3)$$

On the premise of recognizing both quantum mechanics and theory of relativity, we must recognize the volume contraction mechanism of moving objects. Equation (3) is the volume relativistic effect — the relativistic relationship of volume-velocity. This

conflicts with the Lorentz transformation (in Lorentz transformation, $z=z'$, $y=y'$). It can be called the “the difficult of space-contraction mechanism” of special relativity. If we still admit that the moving ruler has a length contraction that does not know the physical mechanism (or no physical mechanism is required, and it is derived from Lorentz transformation), we must admit that the moving objects have double contraction in their moving direction. However, no experiment can prove this double contraction. We have to admit that the contraction of objects due to motion is the contraction in three directions perpendicular to each other, and the space coordinates in Lorentz transformation are formal space coordinates. If you insist that the contraction of the volume of an object and the contraction of space are doomed to be inconsistent, you cannot be sure that what has been experimentally verified must be the contraction of space due to motion.

The work of proving that the distance between molecules is also inversely related to the electron mass is left to the reader. People in doubt can shorten the hydrogen ruler to the size of one hydrogen molecule, so as to avoid the discussion of the distance between molecules. The valence bond theory in quantum chemistry shows that the bond length is also proportional to Bohr radius. The calculation results of quantum mechanics can also show that the size of hydrogen atom is inversely related to the mass of electron. A hydrogen molecule consists of two hydrogen atoms. In this way, the volume of the single molecule hydrogen ruler will shrink due to movement, and the multiple of contraction in the three extension directions is $\sqrt{1-(v/c)^2}$.

No experiment has proved that the length contraction is relative. In other words, no experiment has proved that, when they observe each other, always the opposite ruler shortens. No experiment has proved that, when they observe each other, always the opposite clock slows down. No experiment has demonstrated that a moving rod shrinks twice in the direction of motion. There can only be one of the two conclusions of space contraction without a clear physical mechanism and volume contraction with a clear physical mechanism. The relativistic mass formula should be very reliable. The reason is, numerous experiments have confirmed this mass-velocity relationship. The equation for the radius of the hydrogen atom is also very reliable. In this way, the conclusion that the volume of an object shrinks due to motion with a clear physical mechanism can be more reliable than the conclusion that the relativistic space shrinks without a clear physical mechanism. This example also shows that there is a contradiction in the concept of spatial contraction without clarifying the physical mechanism.

The above 7 examples (5 numbered examples, an example of a moving light source emitting photons and an example of the experimental interpretation of the Muon lifetime) all show that the space contraction of special relativity or the relativity of space contraction or the affiliations of space can cause contradictions. According to quantum mechanics and the mass-velocity relationship of special relativity, the volume velocity relationship — the relativistic effect that the volume of an object shrinks in all directions due to motion is obtained. Special relativity is in trouble (the conclusion based on Lorentz transformation is unidirectional space contraction, while

the conclusion based on the mass velocity relationship of special relativity is omni-directional volume contraction). This trouble is brought about by the formal space coming from the Lorentz transform. Since the space in Lorentz transformation is formal space, it is a coincidence that its prediction of space contraction is consistent with the experiment of object contraction in the direction of motion. Since the space in Lorentz transformation is formal space, it is a coincidence that its prediction of space contraction in the direction of motion is consistent with the experiment of object contraction. In the direction perpendicular to the motion, its prediction of spatial contraction is completely untrue.

Will the intermolecular distance in covalent compounds and the distance between ions in ionic compounds contraction due to motion deviate from Equation (3)? Intermolecular forces (dispersive, inductive, and intermolecular) are all electromagnetic forces in nature. This force is related to the vibrational frequency of the particles in the object. The mass of the particles is greater, the vibration frequency is lower and the distance between particles is smaller. In this way, the object will contract due to motion, just as it contracts with cold. Now we know that the experiment of the rod length shrinking due to motion has confirmed Equation (3) instead of the Lorentz transformation. Both inertial effects and Doppler effects can be described by the principle of relativity. The contradictions of the special theory of relativity revealed in this paper can be eliminated by "cancelling the principle of relativity". Therefore, this article has the following predictions: First, as long as Describe events independent of inertia and Doppler shift, there will be contradictions in the principle of relativity; second, the object in absolute motion shrinks and the clock in absolute motion slows down.

The mathematicization of theory (establishing a mathematical formal system for the theory) pursues the integrity and beauty of the theory. This article explains that the problem of special relativity comes from the concept proliferation caused by its mathematical formal system. This is also a manifestation of imperfect theory. This shows that the concept of proliferation of the theoretical mathematical formal system must be partly discarded. In other words, the interpretation of "quantity" in the theoretical mathematical formal system must be continuously improved and optimized.

The physics concept in the mathematical formal system of the physics theory is allowed to have no corresponding objective reality. It is similar to complex numbers that allow no corresponding objective reality in pure mathematics. They all describe the needs of objective reality. The mathematical formal system of physics theory is

not equal to its mathematical logic system. We do not allow the mathematical logic system to conform to the facts. The positive effect of the mathematical formal system is to "strengthen the logical connection between concepts and perfect the theoretical system", and its side effect is to cause the proliferation of some untrue conclusions (or proliferation of unreal concepts). It is not surprising that a true conclusion is occasionally derived from the unreal concept or conclusion of hyperplasia. Recognizing the structural and functional laws of this kind of physics theory can make human beings look at the existing theories more dialectically. Recognizing the structural and functional laws of this kind of physics theory can make human beings look at the existing theories more dialectically.

The mathematical formal system can lead to the proliferation of concepts, which is not unique to special relativity. The law that the theoretical mathematical formal system can lead to the proliferation of concepts is also applicable to general relativity, quantum mechanics, and even engineering technology theories. Readers can try to prove whether "space bending", "quantum teleportation", "quantum state superposition" and "quantum superposition state collapse" are accretive concepts. Superstring theory first establishes a purely mathematical formal system and then adds corresponding physical explanations to this system. Only when the mathematical form of the theory is absolutely flawless, the superstring theory is correct. If the superstring theory cannot be confirmed by experiments, it shows that the 11 dimensional spaces in superstring theory is also a formal space. The four-dimensional space is also the formal space of Minkowski geometric accretion (especially the fourth dimension). If the experiment only involves the traditional three-dimensional space in the four-dimensional space, the experimental results may also be consistent with the facts. The four-dimensional space cannot be represented by coordinate diagram, so we can't expect to show it by experimental method. The fourth dimension is only a variable, not a spatial dimension. Therefore, the experiments on the ground are traditional experiments in three-dimensional space. We can't expect such experiments to directly prove the authenticity of four-dimensional space.

In fact, this article provides a principle that can be used to judge the correctness of the old and new theories and the correctness of the theoretical support and opposition.

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