# Piercing the Veil of Modern Physics. Part 2 & Philosophy

DING Jian[*]

Integrated Electronic Systems Lab Co. Ltd., Jinan 250100

## Abstract

Based on Aristotle's definition, all the knowledge was able to be divided into three parts: natural science, metaphysics and mathematics. Among them, we can distinguish between natural science and metaphysics according to whether there exists in reality. And the principle of the limit in mathematics helps us to break the bondage of finite thought. From the quantitative changes of real space to have gone deep into a qualitative difference of ideal realm, it has accomplished the unity of opposites of all knowledge. Take the postulation as an example. This concept corresponds to limiting value, and is a hypothesis that humans can only be continually to modify the one-sided view to approach the truth but can't use empirical methods to prove or disprove it. Newton's First Law is such a postulation, which has invariance or absoluteness, can be called the absolute truth, and belonged to the metaphysical category. According to the above philosophical principles we have found that in Einstein's special relativity there is a paradoxes, which is to use an absolute truth (the principle of constant light velocity in vacuum) to overthrow another absolute truth (the absoluteness of simultaneity) but one of them can't be proved to be false. And his mistake to be found out, which is to confuse the light speed in reality with the $c$. So, starting from the perspective of all knowledge, all the inertial systems are redefined, Galileo's coordinate transformations once again enabled; and in order to eliminate the false and retain the true, Einstein's two postulations in special relativity are reshaped, which can make them reasonably to return to the framework of absolute space-time. Finally to point out, it has been identified that so-called "Nonbeing" in *Lao-tzu* is the "metaphysics", which will certainly have great significance to unify the Eastern and Western philosophy.

**Keywords:** special relativity; natural science; metaphysics; mathematics; noumenon; absolute truth

**PACS:** 03.30.+p; 01.70.+w; 02.90.+p; 11.10.Cd

---

[*] Corresponding author introduction: DING Jian, Male, Retired, metaphysics and physics. E-mail: jiandus@163.com

# 1. Introduction

This article is the second part of full text of "Piercing the Veil of Modern Physics." First, it should be noted to adopt Roman alphabet to quote the content of other parts in the full text. For example, the fundamental part of full text [1] can be quoted by "paper I" and the formula 2 therein can be quoted by "I-2" and so on.

As the cut-in point of this article, we introduce Einstein's an argument [2]: "The 'principle of relativity' in its widest sense is contained in the statement: The totality of physical phenomena is of such a character that it gives no basis for the introduction of the concept of 'absolute motion'; or shorter but less precise: There is no absolute motion." This represented Einstein's understanding in his later years (in 1948) for own relativity and the whole of physics. Since there was no absolute motion (or reference frame), its scope of application could only be limited to the relative motion in real physical space.

In this article, so-called real physical space is mainly aimed at its most fundamental medium—ether. In terms of vacuum, according to its etymology, refers to the void which is nothing at all and does not exist in reality. It can also be called an ideal vacuum, or absolute vacuum. As for the container has been fully evacuated and stabilized at higher vacuum degree, the remains of the container at this time can be regarded as being close to pure ether. In this regard, must give the corresponding prompt in advance.

"Blind Men and the Elephant," the allusion came from ancient Indian Buddhist scriptures [3], it warned us to be not able to use one-sided view to treat overall problem. Or else, there would be a state of endless debate and each airs his own views. Einstein was to confine his own in the realistic physical space, and attempted to use the finite thinking way to explore all the physical phenomena and their moving laws. Just as Chinese poet Sushi (1037-1101) said, "I see not the true face of Lushan Mountain because I am in the mountain."

Because there is no absolute motion and only relative, so there will inevitably be a deviation between the resulting conclusion and the truth. Not surprisingly, the results are only two kinds: one is each airs his own views in a state of endless debate, just like the allusions of "Blind Men and the Elephant" to use one-sided view to treat overall problem; while the other kind is gradually to approach the truth in a process which is endlessly to correct the deviation.

As a comparison, we reintroduce Newton's first law of motion [4], which is also known as the law of inertia. It is scientifically to clarify the two physical concepts of force and inertia, and correctly to explain the relationship between the force and the state of motion, as well as to put forward that all bodies have the property to maintain the invariant state of motion—inertia. It is expressed as: Everybody persevere in its state of rest, or of uniform motion in a right line, unless it is compelled to change that state by force impressed thereon.

Obviously, the body described therein is unaffected by forces, no matter it is stationary or moving along a straight line in uniform speed, its motion state is absolute (or ideal) and the scope of application has gone beyond the physical space in reality. That is to say, Newton's first law of motion as the basis of classical

physics has been widely applied to the physical space in the reality; and it prompts us to rethink that the physical phenomena in reality are through what kind of a way does for the introduction of the concept of absolute motion provide a basis?

## 2.    Mathematics provides a basis for the introduction of the concept of absolute motion

In mathematics, when the independent variable of a function tends to infinity or beyond its definition domain, the function will present a limiting value. The necessary condition is to have continuity. The independent variable changes within the definition domain, and makes it close to the limiting value, which is the process to seek the limits, can correspond to the relative motion of physical space in reality. And the limiting value of the function, which corresponds to the absolute motion beyond the physical space in reality. That is to say, the process to seek the limits as well as the limiting value, their physical meaning are to create a bridge between the relative motion of physical space in reality and the absolute motion beyond that.

Take the postulation (axiom or self-evident hypothesis) as an example, which concept corresponds to limiting value. It is a hypothesis (or proposition) whose feature is that in the long-term and repeated the test of practice, humans can only be continually to modify the one-sided view to approach the truth, but can't use empirical methods to prove. On the contrary, the postulation which has been confirmed based on the above feature, nor can be used by empirical methods to prove to be false. Newton's First law of Motion is such a postulation which has invariance or absoluteness, can be called the absolute truth. That is to say, all hypotheses who can use empirical methods to prove or disprove, are not postulation. Therefore, as long as it is a postulation, which must not be obtained through empirical methods in reality, and should belong to metaphysical category.

The word "metaphysics" is composed of "physics" with a prefix "meta", which originated from Aristotle's writings (4th century BC) [5]. In fact, he himself didn't use the word, but put this part of the content into first philosophy (or called Theology), meant to distinguish it from second philosophy (natural science, including physics) and mathematics. The question of the first philosophy to explore is the origin of existence, its characteristic is must to have invariance or absoluteness. Can't use empirical methods to verify in reality, which is the main difference between it and the second philosophy. In reality, there are essential distinctions (being and non-being) between the two, seemingly unreachable, but really have a common border.

According to the definition of limit in mathematics, when the independent variable of a function which has the continuity tends to infinity or beyond its definition domain, the function value equals to its limiting value. As an abstraction of things in reality, the physical meaning here is that in the long-term and repeated the test of practice, humans can only be continually to modify the one-sided view to approach the truth, and when the modifying number of times tends to infinity, the difference between the resulting conclusion and the truth can be arbitrarily small, you can regard the two as a continuum.

That is to say, mathematics in this way of infinite subdivision, helps us to break the bondage of finite thought, from the quantitative change in real space to the qualitative change which has gone deep into the ideal realm of transcending the reality. Mathematics runs throughout the both, not only can accomplish the unity of opposites of all knowledge, also transform into each other. As the introduction of the concept of absolute motion, Newton's first law of motion can be called the starting point of classical physics, which has been widely used the physical space in reality is the best example.

Previously, first philosophy, second philosophy and mathematics, as the full knowledge of human, they were collectively known as Theoretical Sciences. After Aristotle died, when his successor Andronicus (1th century BC) edited his many writings, put that part of the contents which had belonged to the first philosophy to name "metaphysics", and arranged which located after the physics. Due to the prefix "meta" did have the implication of "after", some people put the word "metaphysics" to translate into "after the physics".

But the implication of "after" should focus on the "support and origin" of physics, it seems more appropriate. Since the English's "physics" originated from the ancient Greek culture, the original intention was "nature", while the prefix "meta" contains the implications of "after, support and origin", so the word "metaphysics" can be translated into the "origin of nature", should also be reasonable. This means that the origin of nature is absolute, has invariance, and does not exist in reality. To this, we have to think carefully.

Mathematics is an abstract science. The so-called abstraction is from many things to extract the common or essential features, and abandon their different and non-essential features. In the long-term and repeated the test of practice, for those essential features having invariance or absoluteness, which can't use empirical methods to verify in reality, should belong to metaphysical category. And the others belong to the scope of natural science. Mathematics runs throughout the both, which has constituted all the knowledge. This is the *Lao-tzu* so-called "Tao follows nature." [6]

Therefore, the conclusion after reflection is that the physical phenomena in reality can be with the help of mathematics to provide the basis for the introduction of the concept of absolute motion. And put the above Einstein's argument to modify as: "The 'principle of relativity' in its widest sense is contained in the statement: The totality of physical phenomena is of such a character that each does the utmost to give the basis for the introduction of the concept of 'absolute motion'; or shorter but less precise: There is no absolute motion in reality."

## 3.  The concept in philosophy–metaphysics

The first man who translated English word "metaphysics" into Chinese should be the Japanese scholar Tetsujiro Inoue (1855-1944). According to the Great Appendix III (Section I) [7] of *The Book of Changes*, in which there was "what is above shapes is called the Tao (all the knowledge), what is within shapes is called the implements," he was the earliest to understand and translate it into Japanese. Although the Chinese scholar Yan Fu (1854-1921) had resisted such a translation, and translated the word "metaphysics" into the

"Mysticism", but has not been accepted by the public. As a result, the word "metaphysics" was converted from Japanese into Chinese.

It should be emphasized particularly that in terms of concept and applicable scope, the Chinese term for "metaphysics" which has been translated from Western philosophy, is markedly different from the "above shapes" or the "what is above shapes" in Eastern philosophy. To this, make sure not to confuse. Otherwise, will cause misunderstandings on the concept between Eastern and Western philosophy. If rustically to understand, in the Great Appendix III (Section I) of *the Book of Changes*, for the sentence "what is above shapes is called the Tao;" among them the "Tao" above shapes is the meaning of all knowledge, which can cover all the areas of knowledge (known and unknown, being and non-being, right and wrong, as well as groundless or specious...). Obviously, Natural science (including Physics), Metaphysics and Mathematics have been included in it.

As far as the term "metaphysics", its scope of application is defined as "being qua being" in Western philosophy. In which the involved content is called noumenon (thing-in-itself), does not exist in reality. Although it is impossible to obtain by empirical methods, but not isolated. In reality, it is the limiting value of the change of things, and its feature must have invariance or absoluteness. That is by no means to use isolated, motionless and one-sided viewpoints to see the world. It presents us a process that in view of the things to change in reality, humans can only be through the long-term and repeated the test of practice to modify the one-sided view to approach the truth continually. That is to say, so-called absolute or eternal truths should be belonged to the metaphysical category. And here, it is vital that on the essential concept of "metaphysics" how can Eastern and Western philosophy achieve an accurate consensus?

Actually, metaphysics is an essential element in our everyday thinking. For example, five apples, five people, five countries, five celestial bodies, Roman numerals V, Arabic numerals 5, you can use "five" to express countless things. On the contrary, "five" to be expressed by the various languages or ways, are different nomenclatures which all are aimed at one and the same five "thing-in-itself."

Five thing-in-itself, it does not exist in reality, has invariance or absoluteness, is belonged to metaphysical category. That is to say, although the things related to five in reality, all can't accurately represent it, but each does the utmost to. So, the metaphysical five thing-in-itself is "being" in our knowledge, too. Its "being" is in order to those five existences which are associated with things in reality, and so-called "being qua being". Its feature conforms to the previous discussion of the postulation that in the long-term and repeated the test of practice, humans can only be continually to modify the one-sided view to approach the truth, but can't use empirical methods to prove true or false.

As a noumenon, five thing-in-itself has been through different naming to be presented in reality. Chinese Five, English Five, Roman numerals V, Arabic numerals 5, ..., they respectively are different languages to aim at one and the same noumenon to name. In the subconscious mind of our thinking, these names all are on behalf of five thing-in-itself, because it is the ultimate existence which is absolutely accurate and does not have any deviation. And if you refuse to recognize the absolute ultimate existence, just rely on "translation" to

confirm these names between each other to have the same meaning, there is no guarantee that there is absolutely accurate consensus. So you are bound to rethink again and modify the one-sided view continually, until to approach that ultimate existence gradually.

Similarly, green apples, red apples, rotten apples…, are all apples, this is a simple abstract process in reality. Further to abstract, Chinese apple, English apple, French apple…, they respectively are different languages to aim at one and the same thing-in-itself of apple to name. In general, we don't to rethink this kind of problem: what is apple's thing-in-itself? And whether does it exist? As well as whom does it exist for? Because in the subconscious mind of our thinking, the name of the apple represents its thing-in-itself.

In a word, based on Aristotle's definition, all the knowledge was able to be divided into three parts: natural science, metaphysics and mathematics. Among them, we can distinguish between natural science and metaphysics according to whether there exists in reality. Mathematics runs throughout the both, which has constitute the unity of opposites of all knowledge. That is to say, natural science and metaphysics (materialism and idealism) can thereby become a unity of opposites. So in terms of all the knowledge, metaphysics is indispensable, where you can find some eternal things. For example, the noumena of things or absolute truths.

The thing-in-itself of anything, including postulation or axiom, all have invariance or absoluteness and don't exist in reality, should belong to metaphysical category. They are ultimate being of transcending reality, while which have existed are only just for the existence of things in reality. Therefore, there is no any direct relationship between them, only can associate with the things in reality. For example, the above five thing-in-itself and that of apples, they have to be firstly named as five and apple respectively in reality, and then can be interrelated into five apples.

Another example is Newton's first law of motion, it is not to say that outside the reality there is a real object which is unaffected by forces and moving with uniform speed along a straight line; but tell us that the law is the postulation or axiom to be got by the long-term and repeated the test of practice, when the frequencies of modifying the one-sided view to approach the truth tend to infinity. Its meaning lies only in taking it as an absolute inertia (reference) system, to study the difference between it and the state of motion of each object in reality. So, there have been some concepts, such as mass, mass point, rigid body, Inertial and non-inertia system, as well as Newton's other law of motion. This is like we are appreciating an infrequent ancient painting, first need to confirm its pristine background in chaos, and then can examine specifically in the handwriting, gestural style, painterly idea, and even the structure and imposing manner, as well as other levels.

## 4. Rethinking two postulations in special relativity

Put the word "special" in front of the theory of relativity, it meant that the theory in reality was limited to the premise of all inertial system having equal rights. Like other famous physicist, Einstein also attached great importance to the reference function of inertial system. On November 28, 1919, in his article of *The Times*,

there was an explanation aimed at the special principle of relativity, as follows [8]:

"The state of motion of the coordinate system may not, however, be arbitrarily chosen, if the laws of mechanics are to be valid (it must be free from rotation and acceleration). A coordinate system which is admitted in mechanics is called an 'inertial system.' The state of motion of an inertial system is according to mechanics not one that is determined uniquely by nature. On the contrary, the following definition holds good: a coordinate system that is moved uniformly and in a straight line relative to an inertial system is likewise an inertial system. By the 'special principle of relativity' is meant the generalization of this definition to include any natural event whatever: thus, every universal law of nature which is valid in relation to a coordinate system C, must also be valid, as it stands, in relation to a coordinate system C', which is in uniform translatory motion relatively to C."

Einstein this passage meant that under the premise of equal rights in all inertial system, Galileo's principle of relativity only applied to mechanics, while his special principle of relativity had covered it and to be promoted, so he deemed which could make the mathematical expression of any physical law to have the same form. Here the so-called coverage and promotion, which also meant that the mathematical expression of Galileo's coordinate transformation has been replaced by Lorentz's form.

As the basis of Einstein's special relativity, there are two postulation. The principle of relativity is the first postulation, while the principle of constant light velocity in vacuum is the second. Therefore, Einstein once again mentioned in this article of *The Times* [8]: "The second principle, on which the special theory of relativity rests, is the 'principle of the constant velocity of light in vacuo.' This principle asserts that light in vacuo always has a definite velocity of propagation (independent of the state of motion of the observer or of the source of the light). The confidence which physicists place in this principle springs from the successes achieved by the electrodynamics of Maxwell and Lorentz." Its meaning was that Maxwell's electromagnetic theory revealed the electromagnetic essence of light, and proved the propagation speed of electromagnetic wave in vacuum was the same as the $c$, while Lorentz's transformation had become the mathematical expression form of its special principle of relativity. It should be noted here that there is a conceptual confusion to be concealed in this paragraph.

Compared with his own description when put forward the special relativity in 1905 [9]: "light always propagates in empty space with a definite velocity V that is independent of the state of motion of the emitting body." Only increased the "independent of the state of motion of the observer", there was no substantive change again. First of all to confirm, in these two discourses, the empty space has the same meaning as vacuum, and a definite velocity V is equal to the value of the light speed in vacuum, now it is usually represented by the $c$. Among them, the meaning of "vacuum" can easily be confused, must be vigilant. That is to say, whether the two exist in reality, will lead to different conclusions, and directly affect whether the $c$ is independent of the state of motion of the observer or of the source of the light (emitting body).

By the way, at the 17th CGPM (General Conference of Weights & Measures) held in October 1983, $c = 299792458$ (m/s) was specified as the value of light speed in vacuum, after the new definition of the

length unit "m" was voted through. This was an exact value of an uncertainty equal to 0, and an absolute accurate reference value.

Looking back at the previous discussion for the postulation, we can fully understand that as there is no absolute vacuum, so the $c$ must be an ideal value beyond the realm of reality. That is to say, can't use empirical methods to get its exact value, only be as a limiting value of speed in the universe to approach as far as possible. Obviously, when Einstein quoted Maxwell's electromagnetic theory to define his principle of the constant velocity of light in vacuum, used the word "vacuum." That is to say, only literally, Einstein two times before and after to describe the principle of the constant velocity of light in vacuum was roughly same, just later added "independent of the state of motion of the observer" in the annotation. It is this annotation to show there is ambiguous on his understanding for vacuum. Whether between them is relevant or irrelevant, depends on whether the $c$ is recognized as an absolute motion, and how it is associated with the motion in reality.

## 5.   Where is Einstein's real mistake?

Well, why did Einstein use the mathematical expression of Lorentz's coordinate transformation to replace the mathematical expression of Galileo's coordinate transformation? This was related to the law of speed transformation in Galileo's coordinate transformation. In Figure 1, $k$ and $k'$ are two inertial coordinate system in the four dimensional space-time $(x, y, z, t)$. The inertia system $k'$ relative to $k$ is moving uniformly along the positive direction paralleling to the $x$-axis in a straight line, the law between them follows Galileo's coordinate transformation,
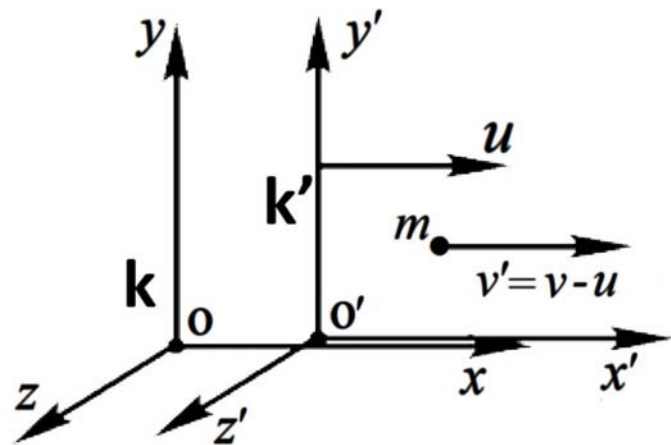


**Figure 1:** The two inertial systems which have equal rights in reality

$$x' = x - ut, \quad y' = y, \quad z' = z, \quad t' = t \tag{1a},$$

$$x = x' + ut, \quad y = y', \quad z = z', \quad t = t' \tag{1b}.$$

Among them, formula 1a is a positive transformation, 1b an inverse transformation. The initial condition is that at the initial moment of $t' = t = 0$, the two inertial systems are coinciding ($o' = o$). After that, the inertia system $k'$ relative to $k$ is moving along the positive direction paralleling to the $x$-axis at a constant speed $u$, ($u < c$). Taking the derivatives with respect to $t$ respectively on both sides of the formulas $x' = x - ut$ and $x' = x + ut$, you can get the formulas of speed transformation,

$$v' = v - u \tag{2a},$$

$$v = v'+u \qquad\qquad (2b),$$

when a point mass $m$ moves along the positive direction paralleling to the $x$-axis. Among them, formula 2a is a positive transformation, 2b an inverse transformation. While $v < c$ and $v' < c$ should be the moving speed of the point mass $m$ in the two inertial systems $k$ and $k'$, respectively.

Einstein based on his own understanding of Maxwell's electromagnetic theory, mistakenly thought that the propagation rate of electromagnetic waves in his so-called vacuum (which was existing in reality) was the same as the $c$. That is to say, whether it is electromagnetic waves or light speed in reality, whose speed $v$ and $v'$ in the two inertial systems $k$ and $k'$ all are $c$. And then further deduced according to this, the result had to be $c = c\text{-}u$ or $c=c+u$, which was contradictory to the formulas (2a or 2b) of the above Galileo's speed transformation. So he came to the conclusion: The $c$ was independent of the state of motion of the observer or of the source of the light.

Obviously, in the principle of the constant velocity of light in vacuum, Einstein's so-called vacuum, it was the ether that he had discarded; while his understanding of the $c$, it was the speed of electromagnetic wave or photon moving in the pure ether. According to the formulas I-4 and I-7 as well as the refraction phenomenon of light, we can know that with the frequency of the electromagnetic wave or light wave are different, their speed are not constant. Besides, they all have the mass-energy. Therefore, it was wrong that Einstein put the electromagnetic wave or light wave in reality as the $c$ in Maxwell's electromagnetic theory.

In terms of the principle of the constant velocity of light in vacuum, it was originally a postulation, but after Einstein to introduce [8, 9], it has no longer been a postulation. This means that he has artificially confused an existence in reality as a nonexistence. Because according to the concept of postulation, it must be admitted that the $c$ is an absolute motion beyond real space, which is a limiting value of speed in the universe. No matter we use what kind of means in reality, the experimental results obtained can only be gradually approached, but not be equal to this limiting value.

Very regrettable! Although Einstein put the $c$ as a base point to use repeatedly in his special relativity, but he couldn't get rid of own thinking which was confined to the physical space in reality, and always firmly believed that there was no absolute motion, so the root of all this was his conceptual confusion. Confined to such a framework of thinking, his research work, including for the understanding and application of Maxwell's electromagnetic theory, it was not accidental to deviate from the right direction. When Einstein thought that the light speed in reality was equal to that in vacuum ($v = v' = c$), according to his principle of the constant velocity of light in vacuum, whether the light speed in vacuum or in reality, all must be independent of the state of motion of the observer.

It is an important admonition that the simultaneity ($t' = t$) which is the basis of Galileo's coordinate transformation is absolute, also a postulation. Its meaning is that if there are two physical events in an inertia system occur at the same time, then in other inertia system can also be deemed to occur at the same time.

However, in terms of electromagnetic waves or light speed, their speed in reality must be less than the $c$. There was a deviation between this and the basis which was used by Einstein to weed out the formulas of Galileo's speed transformation, while the so-called basis was the light speed in reality must be equal to that in vacuum, ($v = v' = c$). Due to the conceptual confusion, a seemingly tiny lapse was occurred in the process of Einstein's derivation. A little deviation might lead to a large error. If he could seriously reflect on, perhaps be corrected. But he did not to do this, while was to deem another postulation – the absoluteness of simultaneity ($t' = t$) existed mistake. Lost the absoluteness of simultaneity, would be in the face of a relative space-time. The same particle moving in the same space, with the increase of speed, ruler was getting shorter, time longer, but couldn't be confirmed in reality. Eventually, went so far as to derive out a paradox that the particle was without mass but with energy. Now, these specious paradoxes have been presenting to us in front, and accompanying by nature constantly to say "No".

In terms of paradoxes, once having invariance or absoluteness, also are the absolute truths of transcending the reality, and belong to the category of metaphysics. The characteristics in reality are also that can't use empirical methods to verify and all things do the utmost to give bases for the introduction of the absolute paradoxes.

Through an absolute truth (the principle of the constant velocity of light in vacuum) to overthrow another absolute truth (the absoluteness of simultaneity), but can't prove which one is false, Einstein's real failure is here. Therefore, returning to the laws of nature is imperative.

## 6. Einstein's mathematical expression about the relative space-time

Look again at Einstein to put forward the special principle of relativity: All the laws of physics are valid in all inertial systems. When using mathematical language to express, is written as: The mathematical expression form of all physical laws remains unchanged under Lorentz's transformation,

$$x' = \gamma(x - ut), \ y' = y, \ z' = z, \ t' = \gamma(t - ux / c^2) \tag{3a},$$

$$x = \gamma(x' + ut), \ y = y', \ z = z', \ t = \gamma(t' + ux' / c^2) \tag{3b}.$$

Among them, formula 3a is a positive transformation, 3b an inverse transformation, and $\gamma = 1 / \sqrt{1 - u^2 / c^2}$ the expansion factor of Lorentz's transformation. Here the choice of the motion state of inertial systems $k$ and $k'$, as well as the initial conditions, are the same as the above Galileo's speed transformation. Since in the inertial systems $k$ and $k'$, the point mass $m$ is just moving along the positive direction paralleling to the $x$-axis, its moving speed is $v = dx / dt$ and $v' = dx' / dt'$ respectively, so according to the formulas 3a and 3b, its formulas of speed transformation

$$v' = dx' / dt' = (v - u) / (1 - uv / c^2) \tag{4a},$$

$$v = dx / dt = (v' + u) / (1 + uv' / c^2) \tag{4b},$$

along the *x*-axis can be obtained. Among them, formula 4a is a positive transformation, 4b an inverse transformation, and $u < c$, $v \leq c$, $v' \leq c$. As already discussed, $v = v' = c$ is wrong. But here must be retained, because it is the reason of Einstein to weed out the formulas of Galileo's speed transformation. Looking back the derivation process from formula 3 to 4, you can also see the following three characteristics:

1.  When the moving speeds of a point mass *m* is $v = c$, $v' = c$; vice versa.

2.  When the moving speed *v* and *u* are far less than *c*, it will degenerate into Galileo's transformation.

3.  Abandoned the absoluteness of simultaneity ($t' = t$), and the speed transformation was independent of the expansion factor $\gamma$ of Lorentz's transformation.

Obviously, the front two points conform to Einstein's expectations. Just in the first point, if the light speed in reality $v = v' = c$, the kinetics formulas ( I-1, I-2, I-3) of special relativity will be placed in a very awkward position, and derive out that the static mass of a photon must be equal to 0 but having energy, this is a specious paradox.

As for the third point, for Einstein negated indiscreetly the absoluteness of simultaneity in the kinematics of special relativity, and used the mathematical expression of Lorentz's transformation, perhaps it was a mild warning. As long as a little attention will find out, the mathematical expression of Lorentz's transformation was only related to his kinetics formulas. If Einstein could understand that the light speed in reality must be less than the *c* ($v < c$, $v' < c$), the mathematical expression of Galileo's coordinate transformation would not be weeded out. His kinetics formulas was still valid, and absolute space-time still existed. And now, people all are vexing in order to use what means to align the two clocks.

Discarded the absoluteness of simultaneity ($t' = t$), just as discarded above-mentioned "five thing-in-itself". Well, for five apples, five people, five countries, five celestial bodies, Roman numerals V, Arabic numbers 5, how can you abstract out the commonality between them accurately? And it is because people no matter to use what means also can't make the two clocks in reality to achieve absolute simultaneity, this has Instead proved that the absoluteness of simultaneity ($t' = t$) is also a postulation (absolute truth). That is to say, there are serious mistakes in the two postulations of Einstein's special relativity. Among them, the formulas 3 and 4 of kinematics should be weeded out, and the formulas 1 and 2 re-enabled.

In this regard, Einstein did not seriously reflect on, but he took with the joy of victory, in this article of *The Times*, there was the following discussion [8]: "Both the above-mentioned principles are powerfully supported by experience, but appear not to be logically reconcilable. The special theory of relativity finally succeeded in reconciling them logically by a modification of kinematics—i.e., of the doctrine of the laws relating to space and time (from the point of view of physics). It became clear that to speak of the simultaneity of two events had no meaning except in relation to a given coordinate system, and that the shape of measuring devices and the speed at which clocks move depend on their state of motion with respect to the coordinate system."

This was a summative evaluation. That was to say, through the special principle of relativity and the

principle of constant light velocity in vacuum, which were already established by him, Maxwell's electromagnetic theory and Lorentz's electrodynamics and Newton's classical mechanics, had been "finally succeeded in reconciling them logically." And thought that as long as through his mathematical expression of Lorentz's coordinate transformation, all physical laws were valid in all inertial systems. Moreover, because he firmly believed "there is no absolute motion," kept optimistic attitude about the relative space-time derived from this, which left a deep impression on us. Well, to deep inside him, was there really so optimistic?

### 7.   Ether is by no means dispensable

A few years later, on July 11, 1923, at the Nordic Assembly of Naturalists in Gothenburg, aimed at the fundamental ideas and problems of the theory of relativity, Einstein was still asking [10]: "The whole development of the theory turns on the question of whether there are physically preferred states of motion in Nature (physical relativity problem)." Furthermore, he also mentioned that "concepts and distinctions are only admissible to the extent that observable facts can be assigned to them without ambiguity (stipulation that concepts and distinctions should have meaning)."

Among them, the so-called "physically preferred states of motion", was under the premise of "there is no absolute motion" trying in reality to find a reference system which was applied to the universal law of natural world and tested by practice. His purpose was to replace Newton's first law of motion, as it was an absolute motion. Because in his mind, only in this way, the special relativity could be to achieve perfect. Otherwise, why would he ask again and again?

But if he really wanted to consider the correlation between the absolute and relative motion, which was equal to have admitted the absolute motion. And according to this, he must rethink the so-called "facts" which had been identified, that was, the light speed in reality and in vacuum were confused as one. In other words, from the moment when Einstein identified that the light speed in reality was "independent of the state of motion of the observer", he would very much hope to find a reference system which could replace Newton's first law of motion and "there is no absolute motion."

And this kind of reference system does not exist in reality. Just taking the rectilinear motion as an example, if Newton's first law of motion doesn't define a "thing-in-itself of rectilinear motion", so how do people build a precise consensus according to the relative motion in reality and agree on the rectilinear motion? In other words, although Einstein claimed that "there is no absolute motion" in his own special relativity, and Maxwell's electromagnetic theory and Lorentz's electrodynamics and Newton's classical mechanics had been "finally succeeded in reconciling them logically", but couldn't weed out the Newton first law which was an absolute motion.

And if put Newton's first law as the "physically preferred states of motion" to belong to his special relativity, an absolute reference system would appear in it and the "relative" idea did not hold water. Obviously, the depths of his heart was not steadfast, and the subconscious seemed always to remind that his special

principle of relativity had paid the price, which problem related to the simultaneity between inertial systems. And by this, a curving relative space-time, the effects of length contraction and time dilation, as well as a photon without mass but with energy, all had been deduced out.

In addition, Newton's classical mechanics must have a carrier of mechanics—ether. But Einstein has used the vacuum to confuse the etheric rightful place, so that made the two in the incompatible states. To this, he always wanted to avoid, but again had to face it. Ether, as the background of nature, can be considered the most fundamental medium in reality. But very regrettable is that up to this day in the physics community, for it, each airs his own views in a state of endless debate...

In the process that Einstein established the relativity, ether was in a very strange status, first ordered it easy to go, and then called it easy to come, but it was by no means dispensable. The so-called easy to go, seen in 1905 Einstein's papers, when the relativity was started up, he claimed [9] that "The introduction of a 'light ether' will prove to be superfluous..." Fifteen years later, in 1920, Einstein again pointed out [11]: "According to the general theory of relativity space without ether is unthinkable..." This was called it easy to come.

Perhaps we should be to understand like this that Einstein did not abandon the ether when the relativity was started up, just temporarily put it on hold. Actually this was not so. Because in paper I, by formula I-9 and Newton's third law, it has been proved that the ether must exist. When substituting the formulas I-1 and I-7 into I-9, you can convert the average force $F$ suffered by a high-speed particle into the following form:

$$F = -\frac{m_0{}^2 v^3}{h} \gamma^2 \qquad\qquad (5).$$

Here $m_0$ is the static mass, $h$ the Planck constant, and the expansion factor $\gamma = 1/\sqrt{1 - v^2/c^2}$ the same as in paper I. And the negative sign represents the direction of the average force $F$ suffered by the high-speed particle is contrary to that of its moving speed $v$. This means that according to Newton's third law, the ether is also subjected to a counterforce of equal size from the high-speed particle simultaneously. It should be noted here that according to formula 5, this pair of forces are proportional to $\gamma^2$. That is to say, the ether as the most fundamental medium in nature, has been through the form of the mathematical expression of Lorentz's transformation to integrate into the kinetics formulas of special relativity. And this, perhaps Einstein did not realize it.

Of course, according to the results of the Michelson-Morley and other relevant ether-drift experiments, all which were not successful, Einstein could only deem "the introduction of a 'light ether' will prove to be superfluous." And the reasons that these experiments couldn't be successful, were from the classic mechanics which has deemed that the ether as medium should be a static carrier of mechanics. But according to our study in the paper I, this so-called "static", its moving speed is second only to the $c$. And the $c$ as an absolute reference system, it is the "physically preferred states of motion" of that Einstein in a lifetime tried struggle to find but refused to admit.

## 8. Redefining all inertial systems which have equal rights in reality

According to the foregoing, there is no absolute motion in reality, while the $c$ is an absolute motion beyond real space. We can use it as a benchmark, and call the absolute inertial system. As for how it is related to the moving in reality, according to the definition of the limit in mathematics, its physical meaning is: There must be such an inertial system in reality, the difference between its moving speed and the $c$ can be an arbitrary small value. That is to say, between the two is continuous. Although the speed of this inertia system $|u| < c$, but it can be considered the highest value of all inertial systems which have equal rights in reality.

In the same way, you can also find another inertial system, its speed is the lowest value of all inertial system which have equal rights in reality. We can define an inertial system as the static inertial system whose moving speed is not higher than this lowest value in reality. In other words, relative to this benchmark of the $c$, in reality, it can be regarded as an inertial system of moving speed $|u| = 0$, and so-called state of rest in Newton's first law of motion. It is the inertial system associated directly with the kinetics formulas of Einstein's special relativity, and has the function to replace that "physically preferred states of motion" in reality.

The absolute state of rest $|v| \equiv 0$ does not exist in reality. But it can be based on the difference value (constant $c$) between the light speed in vacuum and the absolute state of rest, to be strictly defined. That is to say, the absolute state of rest and the $c$, they are respectively two limit values of moving speed $v$ in reality, just like both ends of a ruler for measuring speed. In reality, we can use the ruler along the moving direction of the ponderable body $m$ to measure its speed $v$, if the measured value is $0.1c$, then its moving speed $v$ is $0.1c$, do the same analogy...

As for the static inertial system that we have defined, as a member of all inertial system which have equal rights in reality, the difference value between it and the absolute state of rest can be arbitrarily small, that is to say, between the two is continuous. Its special advantage is that in reality can act as the so-called state of rest in Newton's first law of motion, and it is an inertial system which is directly associated with the kinetics formulas (I-1, I-2 and I-3).

By the way, for all inertial systems which have equal rights in reality, although their moving speeds all are relative to the static inertial system after we redefine it, but its root is still the absolute inertial system. You can change an angle to think. As there is no absolute motion in reality, it is them to do the utmost for the introduction of the concept, so that we can be from the perspective of all knowledge, in order to define their existences, have to establish the concept of the absolute inertial system. This is so-called "being qua being" in philosophy.

When we use the $c$ as a benchmark, according to the definition of limit in mathematics, and after redefine all inertial system which have equal rights in reality, will find out: Previous people have done experiments for some formulas related to physics, all were dependent on this static inertial system. That is to say, as a basis for

further derivation, you can deem to the formula I-1 to I-4 and I-7, all have passed the test of practice. Also, because the light speed in reality must be less than the *c*, the formulas 1 and 2 of Galileo's transformation are still true in these inertial systems which have equal rights. It should be noted that the *c* is only independent of the state of motion of the source of the light (emitting body).

## 9.    Reshaping two postulations of Einstein's special relativity

As the starting point of special relativity, it is necessary to reshape two fundamental postulations in Einstein's special relativity.

For the special principle of relativity, it is expressed as: All the laws of physics are valid in all inertial systems. When using mathematical language to express, it should be again reinstated as: The mathematical expression form of all physical laws remains unchanged under Galileo's transformation.

Among them, the Galileo's transformation refers to formulas 1 and 2, their domains of definition are $0 < |v| < c$, $0 < |v'| < c$, $0 < |u| < c$. In order to express it more clearly, the modified Einstein's argument in front of this article, here is necessary to list again: "The 'principle of relativity' in its widest sense is contained in the statement: The totality of physical phenomena is of such a character that each does the utmost to give basis for the introduction of the concept of 'absolute motion'; or shorter but less precise: There is no absolute motion in reality."

As for the principle of constant light velocity in vacuum, by the energy convergence effects of high-speed particles (see paper I), has made up for a defect of the lack of continuity between Newton's first law of motion and reality, and making the two fully integrated, such as seamless. It is expressed as: In ideal vacuum, the mass of a photon is zero, and it is always to do linear motion with a definite velocity *c* that is independent of the state of motion of the emitting body.

Among them, the ideal vacuum refers to the void which is nothing at all and doesn't exist in reality. While as for the term photon, it has been explained clearly in the paper I. In short, all high-speed particles radiated from high-density particles should be belong to the category of photons.

Just imagine, if there is a photon in ideal vacuum and it has mass, is that still the void which is nothing at all? On the contrary, the void which is nothing at all, it is always nonexistent in reality, also there shouldn't be any photon. So someone would say, since it is nonexistent in reality, nothing at all, should this be equal to that you didn't say anything?

Obviously, those who raised such question, didn't yet realize that metaphysics has been indispensable in our daily lives. It is an important part of all human knowledge, contains the ultimate starting points for all correct thinking. In other words, this void which is nothing at all and the knowledge related with it, not only are the "Nonbeing" in Eastern philosophy, but also the "Metaphysics" in Western philosophy.

In a void which is nothing at all, there is a photon whose mass and energy are zero, and it is always to do linear motion with a definite velocity *c*. This is an absolute motion, every photon in reality all can't accurately

represent it, but they are all do the utmost to that. So, we need according to the principle of limit in mathematics to take it as an absolute inertia (reference) system. In order to, and is only in order to return to the reality along the same way, to study the difference between the moving state of each photon and the absolute inertial system. As a result, following the concept which is "being qua being" in philosophy, the principle of constant light velocity in vacuum is redefined.

Once returned to reality, there must be such a kind of photons, the difference between their moving state and the absolute inertial system can be arbitrarily small. *Lao-tzu* said [6], "Nonbeing, the beginning of all the being. Being (ultimate being), the root of constituting all things." This arbitrary small difference can't be ignored, in reality, it lies between existence (Being) and nonexistence (Nonbeing). As to whether the two can be transformed each other, our evidence is related to the limiting definition in mathematics. As an abstract of the things in reality, its physical meaning is to create a bridge between existence (Being) and nonexistence (Nonbeing). This is the so-called "creating something out of nothing," also from *Lao-tzu* [6]: "all things come into being from Being (ultimate being), and Being comes into being from Nonbeing."

Here is by the way. From the perspective of all knowledge, relying on mathematics to perfectly express the physical meaning of this process, it is a feature of this paper. While another feature, it has been identified that so-called "Nonbeing" in *Lao-tzu* is the "metaphysics" in Western philosophy. If this idea is able to achieve consensus, and as a basis, perhaps can gradually bridge the misunderstandings which has existed in the Eastern and Western philosophy. And there will be prospective to end the long existence of the situation in which each has aired his own views in a state of endless debate, just like the allusions of "Blind Men and the Elephant" to use one-sided view to treat overall problem.

Once "creating something out of nothing," it means to come back to reality. As already discussed in the paper I, the ether as the background of nature was made up of the electro-ultimate particles. By the definition, the electro-ultimate particles also belong to the category of photons. Such a class of photons, they are moving at the highest speed of all inertial system in reality, and second only to the $c$. Although their mass can be extremely small, but compared with the photon that we define in the absolute inertial system, after all there are mass and energy, as well as the force and inertia associated with it. Although their frequency of fluctuations can be very low, but it has been not anymore an absolutely uniform linear motion. Of course, their moving speed must also be less than the $c$. The "light ether" mentioned in Einstein's 1905 paper, which was a kind of medium to consist of them and called as ether for short.

## 10. Conclusion

This article is the philosophical part of full text of "Piercing the Veil of Modern Physics," trying to redefine the fundamental part of modern physics from the perspective of all knowledge, as follows:

1. Based on Aristotle's definition, all the knowledge was able to be divided into three parts: natural science, metaphysics and mathematics. Among them, we can distinguish between natural science and

metaphysics based on whether there exists in reality. And mathematics runs throughout the both, from the quantitative change in real space until to go deep into the qualitative change of ideal realm, helps us to break the bondage of finite thought in this way of infinite subdivision, not only can accomplish the unity of opposites of all knowledge, also transform into each other. That is to say, all the knowledge is that natural science and metaphysics (materialism and idealism) are with the help of mathematics to form a unity of opposites. As a result, metaphysics is indispensable, where you can find some eternal things. For example, the noumena of things or absolute truths.

2. In mathematics, the process to seek the limit as well as the limiting value, their physical meaning are to create a bridge between the relative motion of physical space in reality and the absolute motion beyond that. The necessary condition is to have continuity. Take the postulation (or axiom) as an example, this concept corresponds to limiting value. While in the long-term and repeated the test of practice, humans can only be continually to modify the one-sided view to approach the truth, but can't use empirical methods to prove it, which corresponds to the process of seeking the limit. On the contrary, the postulation has been confirmed by the above stipulation, nor can be used by empirical methods to prove to be false. Newton's First law of Motion is such a postulation which has invariance or absoluteness, can be called the absolute truth. That is to say, all hypotheses who can use empirical methods to prove or disprove, are not postulation. Therefore, as long as it is a postulation, which must not be obtained through empirical methods in reality, and should belong to metaphysical category.

3. Through an absolute truth (the principle of the constant velocity of light in vacuum) to overthrow another absolute truth (the absoluteness of simultaneity), but can't prove which one is false. This is the collision of Einstein's special relativity with the above philosophical principles. According to this, discover the electromagnetic wave or light wave in reality to be identified as the $c$ of Maxwell's electromagnetic theory, Einstein's mistake should be here. And the root of the conceptual confusion was that he couldn't get rid of own thinking to be confined to the physical space in reality, always firmly believed "There is no absolute motion."

4. According to the above philosophical principles and starting from the perspective of all knowledge, all the inertial systems are redefined, Galileo's coordinate transformations once again enabled. Moreover, in order to eliminate the false and retain the true, Einstein's two postulations in special relativity are reshaped, which can make them reasonably to return to the framework of absolute space-time. Among them through the principle of constant light velocity in vacuum and the energy convergence effects of high-speed particles (see paper I), have made up for a defect of the lack of continuity between Newton's first law of motion and reality, and made the two fully integrated, such as seamless.

5. It has been identified that the so-called "Nonbeing" in Eastern Philosophy is the "metaphysics" in western philosophy. If this idea is able to achieve consensus, and as a basis, perhaps can gradually bridge the misunderstandings which has existed in the Eastern and Western philosophy. And there will be prospective to end the long existence of the situation in which each has aired his own views in

a state of endless debate, just like the allusions of "Blind Men and the Elephant" to use one-sided view to treat overall problem.

At last, in view of the universality of philosophy, put forward a question related to sociology for consideration. Whether it is that everyone is born equal, or all under heaven belong to the public, or communism, all are as absolute truths and equivalent to absolute fairness. Therefore, in terms of the "abolition of private property" in *Manifesto of the Communist Party*, its goal should be as fair as possible in the world. And if dogmatically to abolish the concrete private properties in reality, it would cause disastrous consequences. Because public ownership is a unity of opposites formed by a certain number of private properties, if there are no private properties, how does the public ownership exist?

## References

[1]     DING J, HU X Q. Piercing the Veil of Modern Physics. Part 1 & Basics (in Chinese) [DB/OL]. http://vixra.org/abs/1706.0208, 2017-06-26/2017-09-11. (And in Chinese is http://vixra.org/abs/1706.0489, 2017-06-13/2017-09-11.)
[2]     Albert Einstein. The Theory of Relativity [A]. FanG Z Q, Han W B, He W G. Out of My Late Years by Albert Einstein[C]. Hainan: Hainan Press, 2000: 41-41. (in Chinese)
[3]     Sakyamuni. Dirghagama-sutra (Vol. 19) [M]. Buddhayasas, Zhu Fonian. Beijing: Sino-Culture Press, 2013: 609-610. (in Chinese)
[4]     Isaac Newton. Philosophiae Naturalis Principia Mathematica [M]. ZHAO Z J. Beijing: The Commercial Press, 2006: 15-15. (in Chinese)
[5]     Aristotle. Metaphysics [M]. Wu S P. Beijing: The Commercial Press, 1995: 222-222. (in Chinese)
[6]     WANG B, LOU Y L. The Collation and Explanation of Tao Te Ching by Lao Tzu [M]. Beijing: Zhonghua Book Company, 2008: 64, 1,110. (in Chinese)
[7]     Feng Y L. A Short history of Chinese Philosophy [M]. Tu Y G. Beijing: Peking University Press, 1985: 328. (in Chinese)
[8]     Albert Einstein. What Is the Theory of Relativity [A]. Xu L Y, Fan D N. The collected works of Einstein (Vol. 1) [C]. Beijing: The Commercial Press, 1976: 110-111. (in Chinese)
[9]     Albert Einstein. On the Electrodynamics of Moving Bodies [A]. Xu L Y, Fan D N. The collected works of Einstein (Vol. 2) [C]. Beijing: The Commercial Press, 1977: 84-84. (in Chinese)
[10]     Albert Einstein. Fundamental ideas and problems of the theory of relativity [A]. Xu L Y, Fan D N. The collected works of Einstein (Vol. 1) [C]. Beijing: The Commercial Press, 1976: 181-181. (in Chinese)
[11]     Albert Einstein. Ether and the Theory of Relativity [A]. Xu L Y, Fan D N. The collected works of Einstein (Vol. 1) [C]. Beijing: The Commercial Press, 1976: 128-128. (in Chinese)

# 撩开近代物理学的面纱 II（哲学篇）

丁健

（积成电子股份有限公司，济南 250100）

**摘要：** 依据亚里士多德的定义，全部知识可以划分为自然科学、形而上学和数学三个部分。其中，自然科学与形而上学之间，可以依据在现实中是否存在予以区分。而数学中求极限的原理，帮助我们突破了有限思维的束缚。从现实空间中的量变一直深入到理想境界中的质变，实现了全部知识的对立统一。以公设为例，这个概念对应于极限值，是人类只能以偏渐全地逼近，却无法用实证的方法去证明或证伪的假设。牛顿第一定律就是这样的公设，具有不变性或绝对性，可称之为绝对的真理，归属于形而上学的范畴。依据上述哲学原理发现，在爱因斯坦的狭义相对论中，存在用一个绝对真理（真空中光速不变原理）去推翻另一个绝对真理（同时的绝对性），却不能将其中一个证伪的悖论。并且找出了他的错误，就是把现实中的光速混淆为真空中光速值 $c$。于是，从全部知识的角度重新规范了所有的惯性系，再次启用伽利略坐标变换；去伪存真，重塑爱因斯坦狭义相对论中的两个公设，使其合理地回归到绝对时空的框架之中。最后指出，认定《老子》中所谓的"无"就是"形而上学"，这对统一东西方哲学具有重要的意义。

**关键词：** 狭义相对论；自然科学；形而上学；数学；本体；绝对真理

**中图分类号：** O412.1；N02；N3；O1