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The Essence of Special Relativity and Its Influence on Science, Philosophy and Society

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The foreword of the professor Joseph J. Smulsky (<http://www.smull1.newmail.ru>), translator of this paper in Russian

The content of the paper corresponds to its name and is an important landmark in search of scientific truth in physics of 20-th century. The big achievement of paper is that it was written not by one author, i.e. at once five researchers came to the consent, and they represent the common opinion on the most difficult problem of a contemporary science.

I agree with the majority of conclusions of the Chinese researchers. In Comments I have denoted some distinctions in the understanding of this problem and have given some results of my researches which allow to do not use the Special and General Theories of Relativity.

This paper discusses the current status of special relativity in science and philosophy, as well as society, the reasons for special relativity becoming famous, three viewpoints on special relativity in academe, four attitudes of public on special relativity, comments of famous scientists on special relativity, periodicals and scientific meetings as well as networks studying questions on special relativity. This paper sums up arguments that focus on special relativity, analyzes the mistakes of logic in special relativity, investigates the authenticity of validations and applications of special relativity, and concludes that the essence of special relativity is a wrong logical inference embarking from the idealist standpoint. It analyzes special relativity's harm in science and philosophy as well as society. This paper advocates the materialism style of seeking truth from facts and the publication policy of a hundred flowers blossom and a hundred schools of thought contend, in order to liberate scientific research from its imprisonment in special relativity. The views of space-time and mass-energy of idealistic special relativity should be abandoned, and the views of space-time and mass-energy of materialism should be restored and developed.

Introduction

As one of the two important pillars of contemporary physics, Special Relativity Theory (SRT) [1-2] came into being an entire century ago. The common people know of SRT and its author, Albert Einstein. It is in the compulsory curriculum at the university and college. However, the rationality of its foundation and the accuracy of its deductions are constantly suspect [3-44]. There exist two viewpoints on SRT, poles apart from first to last. One is 'the giant' theory, held by those who think highly of SRT; the other is 'the disaster', held by those who think poorly of SRT. Therefore, it is vitally important to investigate its essence, and its influence on science, philosophy, and society. This will make unprecedented sense to the development of science, technology and philosophy.

1. Current Status of SRT, Philosophy, and Society

SRT has been in 'jewel' status since 1905. Today, it occupies absolutely the dominant status in science, philosophy, and society. It is taken as one of the contemporary bases of theoretical physics. Any assumption or measurement conflicting with SRT is proclaimed wrong. The undergraduates must study SRT, and there are Einstein statues, figures and photos everywhere in the university and high school campus. It is summoned to learn from Einstein. The United Nation decided on 2005 being the international physical year and world-wide celebration for the 100* anniversary of SRT's publication.

2. Reasons for SRT Being Famous

For the public: 1) SRT has become university physics compulsory content; 2) they have received all kinds of views of experts in a long time; three, because of lacking enough understanding and pondering; many people think that it is right, but they don't know the reason.

The American weekly Time and the British network BBC launched a little vortex of 'the genius theory: They support SRT as being in the top ten scientific achievements in 20th century, respect Einstein as the second of the millennium great thinkers, and cry up Einstein's cerebrum vagarious, *etc.*

Domestic Chinese media also isn't willing to drop behind. In a short time, 'time travel' and the 'Big Bang' become front-page news. Some people attack tooth and nail any dissimilar learned view and suppress any learned criticisms of SRT. And they say criticizing SRT is 'propagandizing pseudoscience'.

The media elevates SRT, and suppresses critical opinions, so that SRT becomes almost scientific religion, and Einstein is taken for its god.

3. Three Appraisals of SRT in Academia

- 1) It is right, and it is one of the two greatest basic physical discoveries in 20th century.
- 2) It is a combination of truth and falsehood.
- 3) It is absurd.

4. Four Attitudes toward SRT

There are four kinds of attitudes toward SRT: supporters, amenders, objector, and spectator.

1) Supporters allege that SRT is correct, and that opposing SRT means anti-science. Their occupations are mostly teaching or researching in SRT. A few of them don't know there is some thing wrong in SRT, but the majority of them understand it is wrong. But they don't admit it is wrong for the reason of polity, economy as well as fame.

2) Amenders. They think SRT is almost correct, but there occur some 'paradoxes' because the foundation of SRT is unclear. Where SRT is used and error is detected, they can amend SRT interminably. They can publish many papers, but it is a fool's errand to deal with them.

3) Objectors think SRT should be abolished for its essence is absurd. They can get little benefit from espousing this view, just one paper maybe.

4) Spectators think that SRT may be wrong, or not wrong, but it is none of their business. Actually, they don't engage in work about SRT, but social influence also would involve them at last. It is only the degree that is different.

5. Famous Scientists' Views on SRT

Many scientists think that SRT is correct; most scientists hear that it is correct; and some think it is wrong¹ (**The top numerical indexes mark the comments submitted at the end of the paper**). The media have propagandized enough from the point of view of admiration. Some anti-viewpoints have been introduced as follows:

- 1) The Nobel prize committee refused award Einstein prize for SRT.
- 2) Famous scientists who were contemporary with Einstein - Lorentz, Poincare, Rutherford, *etc.* - all disagreed with it.

- 3) Most experimental physical scientists don't admit it; for example A. O'Rahilly, H. Ives, F. Soddy, P. Graneau, N. Graneau, S. Marinov, P. Pappas, and so on.
- 4) Michelson, the main founder of the Michelson-Morley's experiment, pained all his lifetime because his own experiment produced the monster of SRT.
- 5) Dr. L. Essen, who was the director of time frequency department of national laboratory in England, said: "Physicists' attitude toward special relativity is not to understand it almost; but which is reckoned is right for being recognized, it must be admitted. I was thinking so in the past."
- 6) H. Dingle, the former supporter of SRT, did attack it tooth and nail after finding its bumble, and resolutely called out about "science being in the crossroad".
- 7) H. Alfven, who was an internationally famous scientist and winner of Nobel Prize, denounced SRT "an only bibelot" and "it blurs the borderline between the science and pseudoscience".
- 8) T. Barnes, emeritus physics professor in the University of Texas, called out that SRT *is* "a disaster" and "it is time to change worshipping blindly special relativity!"
- 9) Lu Hoff, academician, famous theoretical physicist, broke through unnumbered big blocks in his octogenarian and sent out a paper "Challenging to Einstein". At last, he wrote the last words-"The common editorial department has no courage to publish the paper because they worship blindly Einstein and they are afraid of being considered ignorant of physics".
- 10) Zheng Quan, Professor of Research Institute of Dynamics of the Chinese Academy of Science, has objected to SRT since 1961, and has published many monographs against SRT.
- 11) Song Jian, former state councilor, director of National Science and Technology Commission, vice-president of CPPCC and the president of Chinese Academy of Engineering, boldly opposes Einstein and calls out to young scientists: "The entire 100 years ago, Einstein had an ana [saying]: 'It is impossible for anything moving faster than light speed' in his special relativity paper making world science inconceivability. It has been called as "light barrier" nowadays. However, it has not been proved by any direct experiment². Due to space flight technology development recently, it makes scientists analyses and self-reflection: Why the speed of spacecraft can't exceed velocity of light?" [41]
- 12) Prof. Jeremy Dunning-Davies from the British Hull University and Prof. Stein E Johansen from the Norwegian University of Science and Technology point out that nowadays physical scientists keep to run-of-the-mill SRT. They do not counter scientific argument with scientific argument, but instead inhibit them using more and more religious means. [43]

6. Meetings, Learned Publications, and Web- sites for Researching SRT Problems

In North America, international symposia or seminars with titles such as "challenging contemporary physics and cosmology" are held every year by the Natural Philosophy Alliance. An international meeting critical of SRT sponsored by Muscovite academy of sciences has been held continuously more than six times and it is larger and larger. Just as Petr Beckmann, America's famous late editor in chief of "Energy" and "Galilean Electrodynamics", summarized: "special relativity still suffers so extensive resistance after unprecedented successful nearly 90 years, from Canada to South Africa, from Europe to Australia, from St. Petersburg to Beijing *etc.*" The magnificent scale and long lifetime are rare in history.

On July 29~30, 2000, an academic meeting on the Einstein's SRT question was held in Beijing of China. In 2003, three seminars aiming to negate or exceed Einstein's SRT was held in China. They are respectively: "the first annual meeting of Beijing special relativity research sodality", in Beijing, August 15-17; "the second national academic meeting of Einstein's special relativity questions", in Beijing, August 23-24; "the international academic meeting of special relativity and contemporaneity physics innovation" in Xi'an (China), October 11-13. Since 2004 in China, there have been several academic meetings opposing SRT.

Publications objecting to or surmounting SRT include: "Galilean Electrodynamics", "Apeiron", "Physics Essays", and "Invention and Innovation", *etc.*

There are several dozen websites about objecting to or surmounting SRT. There are more than 20 websites of representatives as the website of Beijing special relativity research sodality among them.

Recently, there are dozens of monographs to negative special relativity published in China.

7. The Argument Focus of SRT

Is SRT is right entirely, locally right and locally wrong, or wrong entirely?

The experts 'mastering' SRT think it is great scientific theory, a good foundation for today's physics; it has been proved by experiment, and no serious error emerges. They think that whoever criticizes SRT is 'propagandizing pseudoscience'.

Several scholars think there is something correct in SRT, but at the same time there is serious error; for example, deviation from fact, self-contradiction, puzzling mathematics. SRT is twisting experiment and misguiding practice, so its replacement should be actively sought.

Some scholars think SRT is built on the foundation of wrong mathematics and illusion. It is really a myth about getting 'experimental confirmation'³.

8. The Theoretical Foundation of SRT

The error in SRT comes from its assertion of constant light speed. [1,2] The light-speed principle is; 1) light always propagates in empty space with a definite speed c that is independent of the state of motion of the emitting body [1]; 2) light speed measured in vacuum is same for any of uniform rectilinear motion of the measurer.

There are two understandings of the principle of constant light speed, stated as follows:

- 1) In any inertial reference system, the light speed relative to the system is the same for light emitted by a lamp-house fixed to this system.
- 2) In any inertial reference systems in uniform rectilinear motion with respect to each other, the light speeds measured are the same for light emitted by same lamp-house.

The Lorentz coordinate transformation misunderstands the principle of constant light speed as: for a special light, in all inertial reference systems in uniform rectilinear motion with respect to each other, light speeds are the same relative to these inertial reference systems. This ignores the relative motion between different coordinate systems, which results in a series of falsehoods.

The light speed exists only as the speed of signal transfer in SRT, which has no use for any other special quality of light. Then, if light speed for signal transfer is replaced by speed of sound, and the principle of constant light speed is changed into a principle of constant sound speed, then the result would be that the speed of any object is less than sound speed. This is clearly absurd; a bullet's speed is faster than sound speed, and a plane's speed can exceed sound speed also.

Therefore, the theoretical foundation of SRT is wrong⁴.

9. The Practical Foundation of SRT

- 1) For developing his space-time view, Einstein had only thought experiments, not real ones.
- 2) By analyzing data from more than 60 experiments 'proving' SRT, famous physical scientist W. Kantor came to the conclusion that they are all based on wrong methods and invalid logic. Professor Huang Zhixun of Communication University of China got the same result.
- 3) SRT cannot explain reasonably the Doppler effect on light. The classical Doppler phenomenon is that a red-shift should emerge with a lamp-house leaving the observer. But the relativistic Doppler phenomenon includes a blue-shift that would more be clear with higher relative speed⁵.
- 4) Most supporters of SRT admit that heretofore there is no experiment observing Lorentz length contraction.
- 5) The public think it is a magnificent proof of SRT that the A- bomb detonated successfully. However, Thomson and Kaufmann have done many experiments and much

theory research about the mass-velocity relation and mass-energy relation⁶ with others before SRT appeared in 1905. Austrian physicist Hasenohrl proved the direct proportion relation between mass increase with radiant energy, and got the famous formula⁷: $E = mc^2$ in 1904.

10. The Essence of SRT

- 1) 'Relativity of simultaneity' is a false proposition. It is gotten through secretly exchanging concepts, shifting premises, and confusing feeling and reality, reflection and actuality.
- 2) The mathematical foundation of SRT, namely Lorentz transformation, is a group of self-contradictory mathematical equations that have no scientific value⁸.
- 3) SRT has not been proved using any experiment. Of the so-called 'experimental confirmations', some are spurious and some are coercively mislabeled as such.
SRT is a kind of religion⁹ disguised as science.

11. SRT's Harm to Science, Philosophy, Society

At all times, the experts of SRT allow that the common people cannot understand it. However, the common people have to believe it as a great truth. This is disrespecting the public wisdom. It has become a barrier to scientific development. From micro-world puzzling to cosmology confusion, disaster results.

At the present time, we have a vogue for colorful ideas coming from SRT; for example: "the 4th dimension of space", "the time tunnel", "big bang" and "black hole", *etc.* All of them are the representative of a ghosts and gods theory; for example, Stephen Hawking said that he can play the cards with Newton and Einstein at the same table, the beautiful girl can flirt with the historical king through the time tunnel in science fiction movies.

The argument between SRT supporters and objectors is a battle between mentalism¹⁰ and materialism.

12. The Fate of SRT

- 1) Theoretical physicist Dr. J.P. Wesley said: "The special relativity era has gone." Science is facing a revolution that cannot be controlled by any force for all-time. In this scientific revolution, Chinese students have the ability, and the duty, to thrust our country into the world of advanced science and technology by seizing the lead in the fundamental sciences. China must follow a strategy of 'national rejuvenation through science and education'.
- 2) There now exist the following conditions for overcoming SRT: a) Through education in materialism, seeking truth from facts and scientific development, a generation of scientists are brought up who realize the mistake and danger of SRT, and dare to challenge SRT. b) The policies of letting a hundred flowers blossom, letting a hundred schools of thought contend with each other, have created a good social environment for challenging SRT. c) Phenomena that the Newtonian space-time view had been proclaimed 'unable to explain', and so were only 'explained' with SRT and by SRT experts, can, after all, be explained with the Newtonian space-time view, and the explanation has no 'paradoxes' in it. d) The development of internet technology provides a wide stage for spreading academic thought.
- 3) It takes a long time to overthrow SRT only because: a) 100 years of drumbeating has caused a profound influence on the public, b) SRT supporters whose occupation is propagandizing SRT dominate academia. c) Most people do not understand or worry about SRT.

13. Space-Time and Mass-Energy Views of Materialism¹¹

In order to restore and develop the materialistic space-time view and mass energy view, it must abandon the idealistic space-time view and mass energy view of special relativity.

- 1) Time is one of material existent forms. It is duration and sequence of a matter motion process. It is the objective existence, not relying on people's consciousness, and is eternal. Time is unidirectional, evenly passes, endlessly¹².

- 2) Space is one of material existent forms. It is infinite and boundless. Space is three dimensional and isotropic¹³.
- 3) Mass is one of material essential attributes. It is the quantity of an object containing matter. Matter with zero mass is not existent. If something is a matter, its mass must be bigger than zero¹⁴.
- 4) Energy is the motion-state attribute of matter. The material energy has several kinds of existences forms. Under the certain condition, the material energy may transform mutually between the different forms, but the total energy is invariable¹⁵.
- 5) Relation of time and space: time is time and space is space, they are both objective. Time is not a function of space and space is not a function of time. They are both fundamental elements of describing the material world, and can no longer change after being defined¹⁶.
- 6) Relation of energy and quality: the quality is quality and the energy is energy. They are both fundamental elements of describing matter, and cannot transform mutually¹⁷.
- 7) Mathematical space and physical space are different. In mathematics, a multi-dimensional variable may be described as existing in multi-dimensional space. In physics, we have one-dimensional space (line), two-dimensional space (surface) and three-dimensional spaces (body), but no higher dimensional space (not including time). The multi-dimensional space of mathematics cannot be transplanted directly to physics except if it is smaller than or equal to three dimensions, which correspond in mathematics and physics.
- 8) Atomic energy. Atomic energy comes from internal energy of atoms. Mass and energy shift together. An object releasing energy reduces its mass and energy. An object receiving energy increases its energy and mass¹⁸. The process of emitting atomic energy from an object is the same as a gun shooting a bullet, with mass and energy shifts together¹⁹.

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Lead Author's Biography

Li Zifeng is a professor of Yanshan University, China, SPE member and a member of Petroleum Society of Canada. Before joining Yanshan University, he was first a professor of Daqing Petroleum Institute and then a professor of China University of Geo-sciences. He has published 70 papers and 4 books on drill string, casing, rod pumping mechanics & well bore stability. He holds a BS degree in drilling engineering and an MS degree in machinery engineering from Daqing Petroleum Institute and a PhD degree in petroleum development engineering from Petroleum University, China.

Comments

1. I, by the experience of dialogue with the Soviet scientists, have come to other conclusion. The majority of them consider that SRT - is erroneous. I think that from those, who deeply explored it, the 99 percents of scientists are so considering.

2. Impossibility of superluminal movements of bodies is position without which SRT will be disorganized. However SRT is erroneous, and all its positions and conclusions also are erroneous. Actually, there are no restrictions for speed of movement of bodies. In 1973 in the State Committee on Inventions I have sent Application of No 1937963/26 25 of 9.08.1973 on invention Smulsky J.J. "The method of acceleration of partides up to superluminal velocity" [1]. In books [1-2] I have given a line of schematics for producing of superluminal particles, and in the book [2] the schematic propulsion engine with a superluminal jet of the charged particles is given. To the problem of superluminal movements, to some extent I give attention in works [3-8]. About achievement of planets of other stars with a superluminal jet I wrote in materials [9-11].

3. I have come to firm opinion, that all Theory of Relativity: SRT and GRT are erroneous. They need to be thrown out and forgotten more soon. Instead of SRT the calculation of interactions between the moved charged particles it is necessary to spend under the formula of force:

$$\vec{F}_{12} = \frac{q_1 q_2}{\varepsilon} \frac{\vec{R}_{12} (1 - \beta^2)}{\left\{ R_{12}^2 - [\vec{\beta} \times \vec{R}_{12}]^2 \right\}^{3/2}}, \quad (1)$$

where \vec{R}_{12} is a radius-vector from the second charge to the first; ε is the dielectric permittivity of medium between charges; μ is magnetic permeability of medium; $\vec{\beta} = \vec{v}_{12} / c_1$; $c_1 = c / \sqrt{\mu \cdot \varepsilon}$ is speed of electromagnetic interaction propagation in this medium, and \vec{v}_{12} is vector of velocity of the second particle relatively the first one.

The formula (1) is derived by me from the experimental laws of electromagnetism. And instead of GTR the all gravitational interactions it is necessary to determine with the help of the Newton gravity force. Naturally, at these calculations it is necessary to use the classical (before einsteinium) the mechanics.

4. Really, the principle of constant light speed is the theoretical basis of the SRT. However, with the given standard criticism of this principle by the Chinese authors I disagree.

This question in details considered in my works, for example, [1-2] and a lot of place and time are demanded that here it to state. However I shall note some moments. Firstly, the light it not a body, and speed of light is not velocity of a body. Secondly, light is an action of one body on another. Therefore at consideration of interaction of bodies by light, which move relatively each other, it is interested no speed of light, but those effects, which one body makes on another with the help of light. These questions are considered in my works. And the caused by SRT problems of propagation of light in the relative moving reference systems have no any sense and practical application.

5. In the 19 century there was an erroneous equating of effects at movement of a sound source and light (in the considered text - lamps). If the sound is propagated in the medium, for example, in air, the light does not represent property of medium. I repeat, light represents electromagnetic influence of a lamp on other body, for example, its influence on a human eye. At relative

movement of a light source relatively the receiver, characteristics of their interaction are determined by the experimental laws of electromagnetism. In the book [2] on page 159 I bring the following formulas for cyclic frequency $\omega_v = 2 \cdot \pi f$ and angles of an aberration:

$$\omega_v = \omega \frac{1 + \hat{\alpha}\beta}{\sqrt{1 - \beta^2}}, \quad (2)$$

$$\hat{\alpha}_v = \frac{\hat{\alpha} + \beta}{1 + \hat{\alpha}\beta}, \quad (3)$$

$$\hat{\beta}_v = \frac{\sqrt{1 - \beta^2}}{1 + \hat{\alpha}\beta} \hat{\beta}, \quad (4)$$

$$\hat{\gamma}_v = \frac{\sqrt{1 - \beta^2}}{1 + \hat{\alpha}\beta} \hat{\gamma}, \quad (5)$$

where $\hat{\alpha}_v, \hat{\beta}_v, \hat{\gamma}_v$ represent directing cosines of normal to a plane (front of a light surface):
 $\hat{\alpha}_v^2 + \hat{\beta}_v^2 + \hat{\gamma}_v^2 = 1$.

Characteristics of light with an index “v” concern to interaction of the receiver and a source (lamp), if they move from each other with velocity v. I shall repeat the interaction of the receiver and a light source is defined not absolute, but only by their relative movement. As well as at movement of a magnet inside the coil with a winding, the value of a voltage on its ends is determined by relative velocity of their movement and does not depend on movement of the coil or a magnet relatively other bodies. Therefore formulas describing effect Doppler (2)- (5) for the light phenomena differ from effect Doppler for acoustics, where movement as a source of a sound and its receiver relatively medium is important.

6. In 19 century there was an erroneous treatment of the phenomenon of diminution of acceleration of the electrified particle at increase of its velocity. Reduction of acceleration has been explained by increasing of mass of a particle. Actually, force of interaction between the electrified bodies depends on distance between them and from their relative velocity. All experimental laws of electromagnetism testify to it. As follows from the formula (1) the force of action on it aspires to zero with approach of velocity of a particle to speed of light.

7. I have derived formula $E = mc^2$ in 1968 [1] by using the mechanics of variable mass. If to be set, that all substance of a body may scatter with speed of light, the mechanical energy (potential and kinetic) will be equal mc^2 . However, I think, that to nuclear transformations this formula has no the relation. All values of energies nuclear connections, as well as values of chemical energy of connection, are received experimentally.

8. In my works [1-2] it is shown, that Lorentz transformation arise from the following assumption. The electromagnetic interaction of motionless bodies as I already stated, differs from interaction relatively moving bodies. If the equations describing these interactions and distinguished from each other to equate, it is necessary to transform terms of one equations through terms of other equations. As I have shown in my works, these transformations are Lorentz transformation. Besides it the other transformations are also possible.

So, Lorentz transformations allow transforming the equations for interaction of motionless bodies into the equations for interaction relatively moving bodies. All this is possible only for electromagnetic interactions.

9. About that the modern physics was pulled together to religion, are stated by many believers, on the one hand. And on the other hand, many physicists are inclined to superstitions and those in the greater degree, than more they have liked ideas of SRT. About it I wrote in a number of the works, for example [12].

10. What is mentalism, I did not know. Therefore has typed this word for search in the Internet. I bring its typical explanation to the address <http://hsteachers.narod.ru/teachers/dilin/lek5.html>:

“The Laws of Witchery. Law of Mentalism.

At preparation of a lesson the material of Lori Kebot book "FORCE of WITCHES" is used.

It is far from being everyone it is familiar with positions new physics... For Sages and the witches who have acquired ancient art of our ancestors, the magic and a science are identical power strings, intertissued in a uniform fabric of life. So was always. The magic and natural sciences - allies, and in a combination with each other they form a science of witchery... **Law of mentalism:** the first hermetic principle is the principle of mentalism, which says, that the universe is Mind... mentalism means the following: "all phenomenal world or the universe is anything to others as creation of the Whole Mind, and the universe exists only in this Mind". Differently, all exists in mind of the God or the Goddess, which "have thought up", that we exist".

To epitomize in the single word, the mentalism and the witchery are close forms of insanity. And as it is seen the STR is close to them.

11. With some positions of classical materialism I disagree. In its frameworks the ideal object 'matter' is accepted. Such object is not present in world around. It is fictitious object. Therefore object 'matter' is assumed with imagined properties, which vary in during time. Therefore in 'matter' begins to include not only real bodies of world around, but also imagined objects: a field, energy, mass, space etc. Thus, such materialism smoothly passes in idealism. I name this idealism as idealism of the second class. Its attribute is that to the concepts, which have arisen in the scientific society, is attached significance of real objects of world around. I shall bring examples: phlogiston, ether, a field, entropy, the energy, curved space-time, superstrings, neutrino, graviton etc.

Therefore I offer to all persons to understand matter as the common name of all objects of world around. As the tree is the common name of a birch, an oak, an alder etc.; metal is the common name of lead, mercury, iron etc.; substance - the common name of the solid, liquid, gas etc. So the matter is the common name of all these objects.

I shall add one more specification: 'matter' - is not the common material from which all objects of world around are constructed.

12. In the book [2] I have defined concepts. Without a context of the book they may not to be clear to all. To facilitate understanding, I shall bring an epigraph (mine too) to my book: "All consists of two: world around and its understanding. Therefore I define the concepts with the help of objects of world around, instead of with the help of imagined objects. So, there is my definition of time.

The time characterizes a variability of objects and is determined as the result of comparison the changing of objects with the change of a standard body or object.

13. Before to define space I define size of object and an interval.

Size of object (body) is result of comparison at imposing the standard on object; it is expressed by amount of standards or amount of parts of the standard which can be imposed on object.

Size of an interval between objects is result of comparison by accommodation of standards between objects; it is expressed by amount of standards or their parts.

Space is set of objects and intervals between them.

14. I define mass through mechanical interaction. In the book some definitions, which I here do not bring, are devoted to this.

Mass of a body is quantities of standard bodies, which at action are characterized by some acceleration, drive the same change of properties of counteractive body as the well as considered body.

15. I define the components of mechanical energy according to their application. These are the usual definitions in the theoretical mechanics.

Work of force \vec{F} at moving body on distance $d\vec{l}$ is multiplication of distance $d\vec{l}$ on force projection to it: $dA = \vec{F} d\vec{l}$.

Potential energy (Π) of interaction of bodies is the value, equal to the work with a converse sign.

Kinetic energy (T) of a body is a half of multiplication of a body mass on a square its velocity.

The law of preservation of mechanical energy E at the movement under action of potential forces

$$T_2 + \Pi_2 = T_1 + \Pi_1 = E = \text{const} \quad (6)$$

follows from definition energy: potential and kinetic [13].

16. At my definition of time and space as two properties of objects of world around with this offer of the Chinese scientists: "They are both fundamental elements of describing the material world, and can no longer change after being defined" I completely agree.

17. As I do not know, that the Chinese scientists mean 'quality', this item is not clear to me.

18. I think that there are no bases for statements about identity of mass and energy and about an opportunity of their mutual transformations. All this ideas follow from SRT. They are erroneous. The truth will be established then when all processes in a microcosm, since Rutherford's experiences will be reconsidered without SRT, and on the basis of the force law (1).

19. In case of the gun and a bullet the mass of all components: the gun, a bullet and gunpowder remains without change. Internal energy of powder gases will be transformed to kinetic energy of these three objects and in their thermal energy. All occurs according to laws of the classical mechanics and thermodynamics.

According to these laws there should be processes in a microcosm. The main task of scientists is to throw out SRT and to bring the description of a microcosm into accord with above-mentioned laws.

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