

Babin & Smulsky Discussion **About the Classical Replacement for Special Relativity**

Dear Walter Babin,

In your letter I have noted items, on which I shall state my opinion.

From: Walter Babin
To: Joseph J. Smulsky
Subject : Relativity Theory
Sent: August 31, 2008 23:49

Dear Dr. Smulsky:

- 1.** In your email to Stephen Crothers which I posted on the GSJ, you said "But how will we be without the theory of relativity if all modern physics is based on it?" and in the same email you say, "The theory of relativity can be thrown out, and, as a dreadful dream, forgotten"
- 2.** While I thoroughly agree with you with respect to its theoretical basis, there are certain experiments like in the Compton effect, where it's formulas have applications. 100 years has not rid us of the absurdities inherent in relativity theory, and in my opinion, it continues because there has been no creditable replacement. I have promoted such a replacement over the last 8 years in papers initially presented in Russia in the year 2000.
- 3.** It is an extension of classical mechanics and electrodynamics which, like you, I believe to be the true basis of physics. What I have found to my dismay, is that it is quite one thing for physicists to see the need for a new theory, and quite another to recognize it when it is given!

I have attached a copy of a paper summarizing my findings. **4.** While they deal with electromagnetic interactions, there is obviously a direct parallel in mechanics which I can demonstrate, which leads to the grand unification theory. **5.** If we are ever to leave this metaphysical swampland it will be through a united effort behind a theory solidly grounded on the proven principles of mechanics and electrodynamics.

I would very much appreciate your viewing the paper and would value your comments and criticism of its content.

Kind Regards,
Walter Babin

Smulsky opinion

- 1.** Yes, I confirm that Theory of Relativity (TR), the Special one and General, should be thrown out and forgotten, in spite of the fact that all contemporary physics is based on it. Since the beginning of 20-th century the contemporary physics it is necessary to alter in full conformity with laws of the theoretical mechanics, namely the mechanics of Newton, Laplace and their followers.
- 2.** Not only Compton effect, but also many others is interpreted from positions TR. But all such interpretations and explanations are erroneous, therefore they need to be rejected, and from positions of the classical mechanics they will receive a real explanation.
- 3.** I agree with you, that the classical mechanics and electrodynamics should be the unique true basis of physics.

4. The idea of the grand unification theory is erroneous idea. For the sake of this idea A. Einstein and his followers have created the fantastic micro- and macrocosm, which completely differs from the real world around of us.

The purpose of the science is receiving of the knowledge of the world, instead of creation of imaginations about it. Therefore the all TR is not a science and should be expelled from it. It should be expelled and such purposes in a science, as creation of the grand unification theory.

5. I repeatedly express the consent with you that we can leave behind a contemporary fantastic picture of the world only combined efforts, being based on the classical mechanics and electrodynamics, which were created by our predecessors as a result of experiments and observations, and without using of hypotheses.

And now according to items, which I have placed in your paper I present my reasoning.

A Classical Replacement for Special Relativity

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"Nothing astounds us more than common sense" – Ralph Waldo Emerson.

Abstract:

The following analysis of the theory of special relativity proves conclusively that all formulas and physical effects devolve to those of classical mechanics and electrodynamics.

Specifically, they identify relativistic effects as due to the Doppler modifications of wavelengths, frequencies and energies naturally occurring because of the finite velocity of light in the observer's frame of reference.

Introduction:

This paper is based on the findings covered in previous papers, which are **selectively** displayed herein.

The findings resolve a conflict that has been raging for over 100 years.

On the one hand, we have numerous authors that have identified the obvious logical anomalies in relativity theory.

On the other, the corroborative results for many aspects of the theory found in experiments such as those in the Compton effect.

To this point, the efforts have been divisive, rather than towards an attempt at resolution.

The answer to this problem has been documented in a series of papers, which have been publicly available for about 8 years.

It is one thing to identify the problems in relativity theory, and quite another to **recognize the solution when it is provided.**

No doubt its simplicity is a negative factor to the generations of physicists (both supporters and detractors of relativity theory) who have been led to believe that truth is to be found only in complexity.

So, at the risk of being repetitive...

Basic Arguments:

6. The Michelson-Morley experiment confirms that light travels *in vacuo* independently at a constant, c , in each inertial frame of reference. **7.** The attempt was made by A. Lorentz and A.

Einstein to **retain a universal aether** (despite Einstein's claim to the contrary) and establish **universality** for the speed of light.

This was accomplished through the assumption that space, time and mass were modified in the direction of travel for an object in uniform linear motion.

This assumption was adopted by the physics community, despite the obvious logical absurdities which ensued.

The following shows precisely, that all of the so-called relativistic effects are simply explained through classical means.

Two postulates are adopted.

8. 1. The laws of physics are the same in all inertial frames of reference (Galilean relativity).

2. The speed of light [c] is constant in equivalent inertial frames of reference but will vary according to the characteristics of the medium in which it propagates.

The first postulate was identified by C.

A. Zapffe as **the First Principle of Physics**¹.

This is entirely in keeping with its importance, since it is difficult to understand how any meaningful physical law could exist without it.

By definition, it **rules out the possibility of universal absolutes with respect to physical space, time and mass.**

The second postulate is seen to be a **specific application of the first principle**².

In contrast to Einstein's relativity theory, no limitation or universality with respect to the speed of light is implied.

The logical results derived from the second "postulate" have been detailed in a previous paper³ and listed here in the interest of completeness.

9. Light propagates independently in all inertial frames of reference (Michelson- Morley experiment).

It exhibits compound velocities as measured (not seen) by observers in relative motion.

The existence of a medium specific to each reference frame is required.

The speed is a characteristic of the medium only (and is also independent of frequency⁴).

Its constancy defines the common attributes of the medium through which it moves.

It is a disturbance of the medium.

A localized "object" cannot simultaneously occupy multiple locations.

The observed energy varies directly with relative motion between frames.

There is no contiguity between frames of reference.

Regardless of any presumed underlying metric, the first principle guarantees the equivalence of space and times within each reference frame. **10.** It therefore logically follows that the speed of light in a moving system will be compounded by its motion ($c+v$ or $c-v$) as calculated (not seen) by a "fixed" observer.

11. Kinematics:

We begin with the assumption of isotropic space and uniform time for equivalent frames of reference.

Figure 1 Assume an object travelling at v on the x axis emits a light beam in the y direction at $t = t' = 0$, at origin O in system S' , which is also observable in the fixed system S (Fig.

1).

In time t_1 , it has traveled a perpendicular distance, $ct_1 = L'$ in the moving system, which has reached point $t_1v = O'$.

Light has also travelled the distance, $L = L'$ in the fixed system, but at an angle of, $a = \arccos(v/c)$ to the x axis⁶.

Explicitly, there is no difference in the length travelled by the ray in either system, only in its direction.

This is guaranteed by the constancy of light.

However, the perpendicular distance d subtending angle a is shorter in the fixed system - $d = L$

$$\sin(a)c \sqrt{L(1-v^2/c^2)^{1/2}} \sqrt{L[c^2(c^2-v^2)]^{1/2}} \quad (1)$$

Thus, the “relativistic space contraction”, (since it is a second-order equation) can only be along the y axis rather than in the direction of travel (Pythagorean theorem).

If we assumed a spherical distribution of light emitted at origin O (see dotted lines) at the same time as the light ray, the radius L would be the speed of light c and the distance d would represent the chord drawn perpendicular to the x axis from the moving object to the edge of the wave front in S .

Obviously, the ray cannot exceed the distance of the wave front in the fixed system S as they both propagate at c .

Indeed, if **radiation** were emitted by the moving object, the ratio d/L would simply be the normal variation in wavelength and frequency calculated for a 90° Doppler effect measured in the fixed system of reference⁷.

No modification in space, mass or time is required.

It is merely the displacement of reference frames due to the constancy of light.

In the observer's "fixed" frame of reference, light has traveled a **simultaneous** distance of $c-v$ and $c+v$ relative to the moving object.

This can only apply to radiation.

In fact, as a previous paper⁸ clearly shows, the inverted Lorentz time transformation equations along with those of space, result in the standard equations for frequency and wavelength.

The relativistic beta factor, $\beta = (1-v^2/c^2)^{1/2}$ is removed as it has been proven to be redundant⁹.

$$x = x' + vt' \quad x' = x - vt \quad t = t' + vx'/c^2 \quad t' = t - vx/c^2 \quad (2)$$

Since $x = ct$, and $x' = ct'$, the equations for time become:

$$t' = t(c-v)/c \quad t = t'(c+v)/c \quad (3)$$

The ratios of (3) indicate that **compound times have been substituted for compound velocities**.

This cannot be justified by the dilation of time or asynchronous clocks as it should be evident from the equations that time and space must necessarily contract or expand in one-way motion, depending on the direction of travel.

By inverting the equations in (3), the Lorentz time transformations become light frequencies and the space transformations of (2) become wavelengths.

$$f' = f / (1 [+ \text{ or } -] v/c) \quad \lambda' = \lambda (1 [+ \text{ or } -] v/c) \quad (4)$$

It is obvious that (Fig.

1) provides the basis for **stellar aberration**¹⁰ and its angular dependence on v/c .

The only additional requirement is a discontinuous wavefront.

The photon concept proposed by Einstein fills this requirement.

Photons have a parallel in Huygens wavelets⁴ used to explain the sharp demarcation of light waves at surface boundaries.

Also the **Sagnac effect** is a direct consequence of compound velocities¹¹.

Whether linear or uniform circular motion is involved, the distance (d) (or $d = 2R$) gives the time taken as, $t_1 = d/(c-v)$ $t_2 = d/(c+v)$.

$$t_1 - t_2 = 2dv/c^2 - v^2 \quad (5)$$

Notice that the distance represented by $2d$, when applied to a sub-atomic particle in motion gives precisely the magnitude required by **de Broglie's matter wave**, $\lambda = h/mv$ (relativistic) that would be effective, for example, when passing through a diffraction grating according to Bragg's law.

Obviously, there is no mysterious "matter wave", but only a displacement that varies with velocity due to the finite speed of light.

As the velocity increases, the intensity of radiation emitted in the forward direction results in the so-called headlight effect¹².

The observed effect through the medium of electromagnetic radiation would **imply** an increase in mechanical energy when in fact it is merely a Doppler (field) effect.

It should now be patently obvious, that the required kinematics of relativity theory have been duplicated without deviating from classical physics.

In addition, an explanation for many well-documented effects is given that were inexplicable in relativity, but follow quite naturally from the above.

Nothing new has been introduced.

If the independent propagation of light in each frame of reference appears counter-intuitive, it is only because of the authoritative imposition of Maxwell's and Einstein's "absolutes" for over a century.

13 References:

¹ The phrase and meaning originate in C.

A.

Zapffe's classic paper, A Reminder on $E=mc^2$, $m=m_0(1-v^2/c^2)^{-1/2}$, & $N=N_0e^{-t/\gamma t}$, <http://wbabin.net/science/rickerzap.pdf>.

² This is based on the results of the Michelson-Morley experiment.

Nevertheless, it must be considered conditional in view of the conflicting experimental evidence of constancy on the one hand, and the preferred directions discovered by Dayton Miller² (subsequently confirmed by Michelson and Kennedy-Thorndike).

However, there is a strong possibility that the Dayton experiment measures a **difference in frequency**, *ibid* 4.

³ The Synthesis of Quantum Electrodynamics, Special Relativity and Classical Mechanics, Walter Babin, <http://wbabin.net/babin/wd6.htm> ⁴ The Speed of Light is Independent of Frequency:

B.

Schaefer, Physical Review Letters, June 21, 1999 ⁵ Note:

We are dealing with the **measurement** of space and time, not their meaning.

⁶ Triangle of Velocities, A.

Vukelja, <http://wbabin.net/physics/vukelja2.pdf> ⁷ *ibid*, 5 ⁸ Sub-Atomic Particle Interactions, Walter Babin, <http://wbabin.net/babin/dyna2.htm>.

Also, Relativistic Transformation Equations, Walter Babin, <http://wbabin.net/babin/transform.pdf> ⁹ *ibid*, 7 ¹⁰ See section on aberration, Walter Babin, <http://wbabin.net/fizeau1.pdf>.

¹¹ The Sagnac Effect, Walter Babin, <http://wbabin.net/babin/sagnac.htm>.

See also, the logical conclusions derived from the second postulate at <http://wbabin.net/babin/wd6.htm>.

¹² Physics in the Twentieth Century, MIT Press, Selected Essays, V.

Weisskopf, p 245.

¹³ An analogous situation for light exists with sound propagating in air.

If air travels with a moving system, then sound travels **in that system** at normal speed, but would be calculated (not heard) as moving at $c+v$ or $c-v$ relative to a fixed system.

If the same sound were audible in the fixed system at origin, it would travel at normal speed, but with greater compression and higher frequency.

Smulsky opinion

6. The Michelson-Morley experiment is erroneous. In it is investigated the propagations of light between the receiver and a source, motionless from each other. And results of experiment are used to the receiver moving relatively the source.

This experiment does not give new knowledge of the world. It is necessary to forget it.

This experiment was carried out with the purpose of detection of ether. However the ether is the essence, which was thought up by people. In the reality the ether is not present. So the purpose of the Michelson-Morley experiment was unreal. Therefore it is also necessary to forget ether for this reason.

7. The offers and actions of A.G. Lorentz and of A. Einstein were caused by understanding (interpretation) of the Michelson experiment, however their offers were erroneous.

The cause of mistakes of G. Lorentz and of A. Einstein consists in a lack of their education in the field of the mechanics. Mechanical interactions between bodies are described by strict laws of the mechanics. These scientists did not understand these laws, and for an explanation of interactions and the movements caused by interactions they involved various hypotheses.

8. The principle of the Galilean relativity has no absolute value for all physics. Its importance is exaggerated. The law of a constancy of light speed in inertial frames of reference is senseless in essence. The light is action of a source on the receiver. The light is not a body. About the change of speed of light may be spoken if the source moves relatively the receiver.

9. One of the big mistakes TR is introduction of the frames of reference. For interaction of two bodies it is important their movement relatively each other. The abstract the frames of reference entered by A. Einstein, generate many problems, which have no any relation to the phenomena of the world around.

10. I repeat again, the light is not a body, but it is influence of one body on another. Therefore consideration of movement of light in the frames of reference is senseless.

11. The all kinematics of TR follows from incorrect representation about light. I repeat again and again, the light it not a body, but it is action of one body on another. Therefore the kinematics of TR has no any application. It is necessary to consider the interaction of one body on another with the help of light. This interaction is defined by experimental laws of electromagnetism. I have derived [1 - 3] these formulas and I also have given their in comments (formulas (2) - (5)) of paper Zifengli et al «The Essence of Special Relativity and Its Influence on Science, Philosophy and Society» (<http://www.ikz.ru/~smulski/Papers/EssenceSR2.pdf>). Here I am repeating formulas (2) - (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 $\omega_v = 2 \cdot \pi \cdot f$ 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.

12. I agree with thought of your letter, that physics needs for a new theory but when it occurs, physicists do not want to recognize it.

The reason is consisted that in these theories (except for my one) are rejected one mistakes of TR, but are used others.

The TR has created lateral branch in a science, which is based on fantastic hypotheses. Everything, that is connected with TR, has no a place in a reality. Therefore this lateral branch of a science it is necessary cut off and to throw out.

The Theory of ether also is constructed on a hypothesis of ether. The ether theories also it is necessary cut off and to throw out.

It is necessary to begin from the description of interactions of the electrified and magnetized bodies, being based on laws classical (before-relativistic) mechanics.

I have made it. Therefore I invite all to study my works and to apply them for knowing of our fine world.

In summary I express you the gratitude that enabled me to reflect above questions, which excite both you and me. Although in many respects we are adherents, however there are even more problems, which we understand differently. As we see, for association of efforts is not enough to be the opponent of TR. Except it is also necessary to be the adherent for many other questions.

Sincerely yours

26.09.2008

Prof. Joseph J. Smulsky

References

1. Smulsky, J.J. 1994. "The Electromagnetic and Gravitational Actions (The Non-Relativistic Tractates)". Novosibirsk: "Science" Publisher, 225 p. (In Russia, <http://www.smul1.newmail.ru/English1/FounPhisics/ELGRVZIN.doc>).
2. Smulsky, J.J. The Theory of Interaction. - Novosibirsk: Publishing house of Novosibirsk University, Scientific Publishing Center of United Institute of Geology and Geophysics Siberian Branch of Russian Academy of Sciences, 1999 -293 p. (In Russian, <http://www.smul1.newmail.ru/Books/Theory/Theory.htm>).
3. Smulsky, J.J. The Theory of Interaction. - Ekaterinburg, Russia: Publishing house "Cultural Information Bank", 2004. - 304 p. (In English, <http://www.smul1.newmail.ru/English1/FounPhisics/TVANOT1.doc>)