

New Concept of Simultaneity

(Mathematical Method to Refute Einstein's Electrodynamics based on Constant Present Time Models as Zero and Point)

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Twin paradox versus Definition of Simultaneity: 1. Introduction, 2. The origin of the Twin paradox, 3. Philosophical Considerations, 4. The Twin paradox in the Light of Gauss's modular or Time Arithmetic, 5. Explanation of the calculating Method, 6. Personal note, 7. New Concept of Simultaneity, 8. References

1. Introduction

Let me first quote Einstein's definition of simultaneity in full and inference its contradictory consequences upon:

"...We have not defined a common "time" for A and B , for the latter cannot be defined at all unless we establish by definition that the "time" required by light to travel from A to B equals the "time" it requires to travel from B to A . Let a ray of light start at the "A time" t_A from A towards B , let it at the "B time" t_B be reflected at B in the direction of A , and arrive again at A at the "A time" t'_A ."

"In accordance with this definition, the two clocks synchronize if

$$t_B - t_A = t'_A - t_B. \quad (1)$$

"We assume that this definition of synchronism is free from contradictions..." [1]

The constant present time of human experience where $At=Bt$ contradicts this definition of simultaneity: "...we establish by definition that the time required by light to travel from A to B equals the time it requires to travel from B to A ." [1] where $At \neq Bt$.

Thus, Einstein synchronizes clocks by Eq. (1), which he assumes "is free from contradictions" [1]. From Eq. (1) follows:

$$t_B = t_A + t \quad (2)$$

and
$$t'_A = t_A + 2t. \quad (3)$$

According to (2) and (3), if substituted into (1), it follows:

$$t_A - t_A - t_A + t_A = 2t - t - t, \quad (4)$$

and further follows

$$0 \cdot t_A = 0 \cdot t \text{ or } 0 = 0. \quad (5)$$

We may also try the other way because in the light velocity formula the constant time $2t$ is given by the expression " $t'_A - t_A$ " [1], which does not originate from the Eq. (1), but from the implicated system of equations:

$$t_B - t_A = t, \quad (6)$$

$$t'_A - t_B = t. \quad (7)$$

For the whole time interval of light traveling $2t$, we have to add (6) to (7):

$$t_B - t_A + t'_A - t_B = 2t, \quad (8)$$

$$t'_A - t_A = 2t \text{ Const.}, \quad (9)$$

and taking into account Eq. (3), we get

$$t_A + 2t - t_A = 2t \text{ Const.}, \text{ or} \quad (10)$$

$$t_A - t_A = 2t - 2t, \text{ or finally} \quad (11)$$

$$0 \cdot t_A = 0 \cdot 2t \text{ Const.}, \text{ or } 0 = 0 \text{ Const.} \quad (12)$$

By above simple calculations (Eqs.1-5) and (Eqs.6-12) it is shown that for any clock number or physical time measure given by number, each summa of Einstein's stationary clock times t_A and moving clock times t , by itself equals zero, (0). That means t_A and t are not at all related by Eq. (1) or by " $t'_A - t_A$ " [1]; this fundamentally affects physical interpretation of relativity and gravely undermines the popular name of *The Theory*. But, seriously, what is the relation of t_A and t ? Is it the number zero, only? By the way, what Einstein has written in Eq. (1) is ontological nonsense analogue to the statement: non-horse equalizes non-book.

Let us analyze deeper!

2. The origin of The Twin paradox

Einstein's scheme of applied mathematical method is of Gauss's modular arithmetic, because t is the modulo for consecutive numbers t_A , t_B and t'_A [2]:

$$\text{Stationary clock} \quad t_A \quad t_A + t \quad t_A + 2t \quad (13)$$

$$\text{Moving clock} \quad t \quad t \quad (14)$$

If stationary clock time t_A equalizes moving clock time t by number, we have Galileo's Relativity:

$$t_A + t_A + t + t_A + 2t = t_A + 2t + t + t + t_A, \text{ or} \quad (15)$$

$$t_A = t \text{ or Galileo's } t=t'. \quad (16)$$

But, if t_A does not equalize t by number, it creates the famous Einstein's twin paradox. Before I explain the paradox mechanism, let us look closely into the important matter of interval t limits.

Please, note that Einstein has two time beginnings, t_A and t_0 , for the one and the same start of light ray traveling. The ray of light starts in the space position A at the t_A time and t_0 time simultaneously because t_0 which begins the traveling interval t totally coincides in space with t_A . How does this work?

If we assume the beginning t_0 of the interval t is $t_0 = 0 \text{ Const.}$, and that $t_0 + t_A = t_A$, we clearly see how the t_0 takes the value of t_A . Because it is defined "let a ray of light start at the "A time" t_A ...", the very beginning of the interval t ,

($t_0 = 0$ Const.), simply overlaps t_A in space, taking its time number value, as it is obvious in the Eq. (1). In detail, it is:

$$A: t_A + t_0 \quad t \quad B: t_A + t_0 + t \quad (17)$$

Since $t_0 = 0$ Const., we may take it that t_A , t_B , t'_A are physical limits of time interval t . Because there is no negative time for the values $n = 0, 1, 2, 3, \dots, n$, and $t_0 = 0$ Const., we have:

$$t_A \geq n \quad (18)$$

$$t \geq n \quad (19)$$

What I found crucial for the understanding Einstein's conception of Simultaneity and his Special relativity theory in general is the quantitative relation between t_A and t . Please, keep on mind that all the ends t_0 of t interval are of constant zero value and included in the results. If t_A and t are at all numbers, we have only three possibilities to consider. The first case is Galileo's:

1. $t_A = t$, which is the case equivalent to Galileo's relativity, where $t = t'$. So, according to the scheme, (13-14), and for the concrete number values $t_A = t = n = 2$ and $t_0 = 0$ Const., we have:

$$\text{Stationary clock} \quad 2 \quad 4 \quad 6 \quad (20)$$

$$\text{Moving clock} \quad 2 \quad 2 \quad (21)$$

It follows that

$$t'_A - t_B = t'_A - 2t = t_A = t \quad (22)$$

$$6 - 4 = 6 - 2 \cdot 2 = 2 = 2 \quad (23)$$

From Eqs. (22) and (23) it follows that for the stationary clocks $t'_A - t_B = t_A + t_0$ and for the moving clocks $t'_A - 2t = t_0 + t_A = t_A$, times are equalized, because $t_0 = 0$ Const., so that

$$t'_A - t_B = t'_A - 2t = t_0 + t_A = t_A = t \quad \text{or} \quad (24)$$

$$6 - 4 = 6 - 2 \cdot 2 = 0 + 2 = 2 = 2 \quad (25)$$

It is obvious that for Einstein's hidden condition $t_A = t$, we have Galileo's relativity $t = t'$, where the physical systems which are in motion and those which are not are synchronized, simply because absolute velocity of light equalizes its relative velocity by number, (absolute $C = C'$ relative). If we compare carefully, we may discover that Einstein's $C = C'$ actually plays the same role as $t = t'$ in Galileo's relativity.

The second case refers to Einstein's twin brother, who travels by light velocity, and upon return is younger than his brother on the Earth. Galileo's relativity doesn't hold here because it is supposed that $t \neq t'$, or using Einstein's signs it is $t_A \neq t$, from which arises two new possibilities, $t_A < t$, and $t_A > t$:

2. $t_A < t$ is the case against Galileo's relativity, where we consider $t < t'$. So, according to the scheme, Eqs. (13-14), and for the concrete number values $t_A = 2$, $t = 3$ and $t_0 = 0$, we have:

$$\text{Stationary clock} \quad 2 \quad 5 \quad 8 \quad (26)$$

$$\text{Moving clock} \quad 3 \quad 3 \quad (27)$$

$$\text{If, for moving clock} \quad t'_A - 2t = t_A + t_0, \quad (28)$$

$$\text{it follows that} \quad t'_A - t_B > t'_A - 2t, \quad (29)$$

$$\text{for concrete values} \quad 8 - 5 > 8 - 2 \cdot 3. \quad (30)$$

$$\text{And finally} \quad t'_A - t_B > t_A + t_0. \quad (31)$$

$$\text{for concrete values} \quad 8 - 5 > 2 + 0.$$

If we assume that t_A is actually t_0 , or the beginning of interval t , so that $t_A = t_0 + t_A$ from Eqs. (13-14) it follows for the stationary clocks:

$$t'_A - t_B > t_0 + t_A, \quad (32)$$

$$\text{and for the moving clock} \quad t'_A - 2t = t_0 + t_A, \quad (33)$$

from which it follows that the time of stationary clock and the time of a moving clock are not equalized, because

$$t'_A - t_B > t'_A - 2t. \quad (34)$$

It is obvious for the condition $t_A < t$, that twin brother on the Earth is older than cosmonaut brother, because according to Eqs. (26-27),

$$\text{Earth twin brother's time} \quad t'_A - t_B = 8 - 5 = 3, \quad (35)$$

$$\text{Cosmonaut twin brother's time} \quad t'_A - 2t = 8 - 6 = 2, \quad (36)$$

We see that Earth twin brother's time, 3, is undisputable greater than cosmonaut twin brother's time, 2, and Einstein seems correct, but according to Eq. (1) there is one more possibility in relation of stationary time t_A and traveling time t , and that is $t_A > t$ or, in everyday life, when somebody starts traveling at 3 and is traveling 2.

To those who object that stationary time t_A and traveling time t are not in relation of any kind, because from Eq. (1) are following Eqs. (4), (5) and also (12), my answer is: In the case we finally accept results (5) and (12), we so reject Special relativity theory as a whole, simply because the only relation of t_A and t are going over arithmetical zero which is mathematical object for physical non-existence. In addition, the twin paradox exists only and only if t_A and t are related by number.

The third case concerns Abramovic's cosmonaut twin brother, who travels at light velocity, and upon return, is older than his brother on Earth. This is the condition when Galileo's relativity also doesn't hold, and because $t_A > t$, follows $t > t'$:

3. For the condition $t_A > t$, according to Eqs. (13-14), and for the concrete number values $t_A = 3$, $t = 2$ and $t_0 = 0$, we have:

$$\text{Stationary clock} \quad 3 \quad 5 \quad 7 \quad (37)$$

$$\text{Moving clock} \quad 2 \quad 2 \quad (38)$$

$$\text{If} \quad t'_A - 2t = t_A + t_0 = t_A \text{ Const}, \quad (39)$$

$$\text{it follows that} \quad t'_A - t_B < t'_A - 2t, \quad (40)$$

$$\text{for concrete values} \quad 7 - 5 < 7 - 4. \quad (41)$$

$$\text{And finally} \quad t'_A - t_B < t_A + t_0 \text{ Const}. \quad (42)$$

If we again assume that t_A overlaps t_0 , so taking over the role of the beginning of interval t , according to Eqs. (37-38) it follows that for the stationary clocks

$$t'_A - t_B < t_0 + t_A, \quad (43)$$

and for the moving clock $t'_A - 2t = t_0 + t_A$, (44)

from which it follows that the time of stationary clock t_A and the time of a moving clock t are not equal, because

$$t'_A - t_B < t'_A - 2t. \quad (45)$$

Obviously for the condition $t_A > t$, the Earth twin brother is younger than cosmonaut brother, because by Esq. (37-38)

Earth twin brother's time $t'_A - t_B = 7 - 5 = 2$, (46)

Cosmonaut twin brother's time $t'_A - 2t = 7 - 4 = 3$, (47)

Earth twin brother's time of number 2 is undisputable less than the cosmonaut twin brother's time of number 3.

3. Philosophical Considerations

For non-Galilean condition $t \neq t'$, the Twin paradox is also inconsistent with the given definition of simultaneity [1], because it contains an ontological contradiction.

From $t_B - t_A = t'_A - t_B$ follows the result $t = t$, and so we get two contradictory consequences of dialectical logic type, where yes (t) and no (-t) are of the same physical value and indistinctively generalized as $t = t$:

1. Thesis: the light ray is traveling forward from A to B, (t);
2. Antithesis: the light ray is traveling backward from B to A, (-t);
2. a. Einstein's hidden logical step, $t - t = 0$, from where it follows his Synthesis:
3. $t = t$, arithmetical formality independent of physics.

Einstein's definition of simultaneity is but a crude example of misused Hegel's triad logic.

Watch carefully Einstein's steps in creating physical problem:

1. $t_B - t_A = t'_A - t_B$.
2. $t = t$
 - a. $\Rightarrow t_A = t_B = t'_A$ (Light is not traveling, clocks are synchronous, $t = 0$), and
 - b. $\Rightarrow t_A < t_B < t'_A$ (Light is traveling, clocks are not synchronous, $t > 0$), but in Special relativity theory Einstein neglects ontological criterion, so that
3. $t = t$. Anyway.

Why is a problem? Because of identity $t = t$ by which Einstein synthesized non-motion and motion of the one and the same light ray: if $t = 0$, there is no traveling and the time consequence is $t_A = t_B = t'_A$, but, if $t > 0$, there is traveling and the time consequence is the opposite, $t_A \neq t_B \neq t'_A$. Apparently, Einstein's Simultaneity assumption $t=t$ ontologically identifies motion and immobility, what further means that such simultaneity definition as $t=t$ is physically impossible. In addition, Einstein's mathematics of relativity principle implies zero velocity for any physical object in motion, because *absolute velocity v equals relative velocity v' by space and time numbers and total velocity is $v-v'=0$* , which is in com-

plete contradiction to human experience where motion and immobility are clearly discerned.

These were main errors Einstein did to time by using modular Eq. (1) to *non-relate* numbers t_A and t , Eqs. (5) and (12), in order to generalize ontologically exclusive number values ($t = t$ for both $t = 0$ and $t = 1$), getting that way non-sensible interpretation of physical reality: "...from point to point in Space, time is different, or, each point in space has its own time" [1]. This Einstein's belief directly contradicts to the existence of Physical Reality itself where at least two ends of a length must coexist to sustain Space or Matter.

The arithmetical trick procedure of Eq. (1) - already shown in Eqs. (5) and (12) - could be also analyzed and even better demonstrated in the light of Gauss's Modular or Time Arithmetic [2]:

$$a \equiv b \pmod n \rightarrow t_B - t_A \equiv t'_A - t_B \rightarrow t - t \rightarrow \pmod 0 \quad (48)$$

which directly shows that, from the Einstein's equation $t_B - t_A = t'_A - t_B$, we at all cannot derive the case of traveling, because from $t = t$ follows $t - t = 0$, or which modulo is calculated as $t \equiv t \rightarrow t - t \rightarrow \pmod 0$.

4. The Twin Paradox in the light of Gauss's Modular or Time Arithmetic

From Eqs. (1-4) are following three possible results:

1. $t = t$, or Gauss's notation $t \equiv t \rightarrow t - t \rightarrow \pmod 0$
2. $t_A = t_A$, or Gauss's notation $t_A \equiv t_A \rightarrow t_A - t_A \rightarrow \pmod 0$
3. $0 = 0$, or Gauss's notation $0 \equiv 0 \rightarrow 0 - 0 \rightarrow \pmod 0$

And from there are following possibilities:

1. If $t_A = t$, or Gauss's notation $t_A \equiv t \rightarrow t_A - t \rightarrow \pmod 0$, we have Galileo's relativity;
2. If $t_A \neq t$, or Gauss's notation $t_A \equiv t \rightarrow t_A - t \rightarrow \pmod n$, we have Einstein's relativity or The twin paradox:
 2. a. If $t_A < t$, or Gauss's notation $t_A \equiv t \rightarrow t_A - t \rightarrow \pmod (-n)$,

we have the Einstein's case of the twin paradox when Cosmonaut brother upon return is younger than his Earth twin brother, Eqs. (35-36), but

2. b. If $t_A > t$, or Gauss's notation $t_A \equiv t \rightarrow t_A - t \rightarrow \pmod (n)$, we have the Abramovic's case of the twin paradox when Cosmonaut brother upon return is older than his Earth twin brother, Eqs. (46-47).

5. Explanation of the calculating method

According to Einstein's Relativity principle [1] the time t_A of the stationary system we have to measure over time t of the system in motion, and vice versa, so the calculation is:

for stationary system $t \text{ Const.} = t_B - t_A = t'_A - t_B$ (49)

for system in motion $t_A \text{ Const.} = t'_A - 2t$ (50)

It is obvious that simple giving different number values to $t \text{ Const.}$ and $t_A \text{ Const.}$ creates paradox of asynchronicity.

6. Personal note

Going deeper and deeper into labyrinths of Einstein's soul which I found much more philosophical and poetic then scientific I have finally understood what happened to him: He indeed has discovered completely correct mathematical models for ever-

lasting present or as he called it – Simultaneity. Those were arithmetical zero corresponding to non-dimensional geometrical point. But, inadequate social promotion of his theory has prevented his further spiritual development and he never become fully aware of the true meaning of his own discovery, of *time as nothing that is*.

7. New Concept of Simultaneity

In a broader sense, the above *zero modulo* demonstrates the non-locality of the universal present time, and that is the constant present time of everyday human experience; it is *immeasurable now* and must be represented by 0 (zero is a number without quantity), and geometrically as non-local point (which has no parts, no magnitude).

We should comprehend The Present Time as the fundamental natural law which universally governs the change of the World of Things (space and masse). This would mean that in physical reality there are no time intervals as we imagine them, because in the Universe there is not the flow of time – Constant Present is the only time of Physical Reality (it is physical eternity).

Why then we have the impression of the time flow?

It is because the basic Continuum consists of unequal parts which are subject to synchronicity law. The inequality of electromagnetic entities (of which consist space and masse) creates non-synchronicity or motion which is pure temporal phenomenon. The notions of Force and Energy should be substituted in Physics by mathematical properties of physical bodies, as it was already proposed by H.Hertz, who wondered why light does not spare any energy for traveling, or by still unknown temporal characteristics of bodies, as it was proposed by N.A. Kozyrev.

Proof: Dear reader, when you have started to read this abstract, it was present time and still is. Since ever it was present time, it is, and will be forever. Wake up!

References

- [1] A. Einstein, "On The Electrodynamics of Moving Bodies", in **The Principle of Relativity**, p. 40 (Dover Publication, 1952).
- [2] Carl Friedrich Gauss, **Disquisitiones Arithmeticae** (Leipzig 1801).