Mathematical Methods to Refute Einstein's Electrodynamics

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This paper explores contradictions in Einstein's definition of simultaneity, and their contribution to the famous Twin Paradox. In the Galilean case, $t = t'$, the Cosmonaut and Earth twins obviously age the same, but in the other cases we obtain ontological contradictions. The problem lies in Einstein's synthesis of non-motion and motion of one and the same light ray. Gauss's Modular or Time Arithmetic helps to identify and sort out the fundamental problems. Despite Einstein, only one time has ever existed: the present. The inequality of entities within the electromagnetic continuum creates the non-synchronicity we call motion.

1. Introduction

Let me first quote Einstein's definition of simultaneity in full, and infer the contradictory consequences from it:

"…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

$$t_B - t_A = t'_A - t_B . \tag{1}$$

"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 assumed "is free from contradictions." [1] From Eq. (1) follows:

$$t_B = t_A + t \tag{2}$$

and

$$t'_A = t_A + 2t . \tag{3}$$

By Eqs. (1-3)

$$t_A - t_A - t_A + t_A = 2t - t - t , \tag{4}$$

and further

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

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

$$t_B - t_A = t \tag{6}$$

$$t'_A - t_B = t \tag{7}$$

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

$$t_B - t_A + t'_A - t_B = 2t \tag{8}$$

$$t'_A - t_A = 2t = \text{const} \tag{9}$$

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

$$t_A + 2t - t_A = 2t = \text{const} \tag{10}$$

or

$$t_A - t_A = 2t - 2t \tag{11}$$

or finally

$$0 \cdot t_A = 0 \cdot 2t = 0 \cdot 0 = \text{const} \tag{12}$$

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 sum 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 the 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 wrote in Eq. (1) is ontological nonsense, analogous to the statement: non-horse equalizes non-book.

Let us analyze deeper!

2. The Origin of the Twin Paradox

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

stationary clock t_A $t_A + t$ $t_A + 2t$ (13)

moving clock t t. (14)

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

$$t_A + t_A + t + t_A + 2t = t_A + 2t + t + t + t_A \tag{15}$$

or

$$t_A = t \quad \text{or Galileo's} \quad t = t' \tag{16}$$

But, if t_A does not equalize t by number, it creates the famous 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 time t_0 of interval t is $t_0 = 0 =$ const, and that $t_0 + t_A = t_A$, we clearly see how t_0 takes the value 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, ($t_0 = 0 = \text{const}$), simply overlaps t_A in space, taking its time number value, as is obvious in Eq. (1). In detail:

$$\text{A: } t_A + t_0 \qquad t \qquad \text{B: } t_A + t_0 + t \tag{17}$$

Since $t_0 = 0 = \text{const}$, 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 $n = 0,1,2,3,...,n$, and $t_0 = 0 = \text{const}$, we have:

$$t_A \geq n \tag{18}$$

$$t \geq n \tag{19}$$

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

1. $t_A = t$, Galilean relativity, where $t = t'$. According to this scheme, Eqs. (13-14) apply, and for the concrete number values $t_A = t = n = 2$ and $t_0 = 0 = \text{const}$, we have:

stationary clock 2 4 6 (20)

moving clock 2 2 (21)

It follows that

$$t'_A - t_B = t'_A - 2t = t_A = t \tag{22}$$

$$6 - 4 = 6 - 2 \cdot 2 = 2 = 2 \tag{23}$$

From Eqs. (22-23), 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 $t_0 = 0 = \text{const}$, so

$$t'_A - t_B = t'_A - 2t = t_0 + t_A = t_A = t \tag{24}$$

or $$6 - 4 = 6 - 2 \cdot 2 = 0 + 2 = 2 = 2 \tag{25}$$

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 the 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:

stationary clock 2 5 8 (26)

moving clock 3 3. (27)

If, for moving clock $t'_A - 2t = t_A + t_0$, (28)

it follows that $t'_A - t_B > t'_A - 2t$ (29)

for concrete values $8 - 5 > 8 - 2 \cdot 3$; (30)

and finally $t'_A - t_B > t'_A + t_0$ (31)

for concrete values $8 - 5 > 2 + 0$.

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:

$$t'_A - t_B > t_0 + t_A, \tag{32}$$

for the moving clock $t'_A - 2t = t_0 + t_A$, (33)

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

$$t'_A - t_B > t'_A - 2t. \tag{34}$$

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),

Earth twin's time $t'_A - t_B = 8 - 5 = 3$, (35)

Cosmonaut twin's time $t'_A - 2t = 8 - 6 = 2$, (36)

We see that Earth twin brother's time –3, is undisputable greater then 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 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, 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:

stationary clock 3 5 7 (37)

moving clock 2 2. (38)

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

it follows that $t'_A - t_B < t'_A - 2t$. (40)

For concrete values $7 - 5 < 7 - 4$ (41)

and finally $t'_A - t_B < t_A + t_0 = \text{const}$. (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 clock

$$t'_A - t_B < t_0 + t_A \; ; \tag{43}$$

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

$$t'_A - t_B < t'_A - 2t \; . \tag{45}$$

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

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

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

Earth twin brother's time of number 2 is undisputable less than the cosmonaut twin'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 (or $t = t = 1$) and no (or $t = t = 0$) are of the same value and indistinctively generalized as $t = t$. Einstein's definition of simultaneity is but a crude example of Hegel's triad logic:

1. $t = 1$ or thesis
2. $t = 0$ or antithesis
3. $t = t$ or synthesis

Watch Einstein's steps in creating the 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, $t = 1$), but in Special relativity theory Einstein neglects ontological criterion, so that
3. $t = t$. Anyway.

What's the problem? The identity $t = t$, by which Einstein synthesized non-motion and motion of one and the same light ray: If $t = 0$, there is no traveling and the consequence is $t_A = t_B = t'_A$, but, if $t = 1$, there is traveling and the consequence is the opposite, $t_A \neq t_B \neq t'_A$. Apparently, Einstein's simultaneity assumption, $t = t$, ontologically identifies motion and immobility, which further means that such simultaneity definition as $t = t$ is physically impossible. In addition, Einstein's mathematics of the 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 complete contradiction to human experience, where motion and immobility are clearly discerned.

These were the main errors Einstein did to time by using modular Eq. (1) to *non-related* 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 belief of Einstein's 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 arithmetic procedure, or trick, of Eq. (1), already shown in Eqs. (5) and (12), could also be analyzed and even better demonstrated in the light of Gauss's Modular or Time Arithmetic [2]:

$$a \equiv b \mod n \rightarrow t_B - t_A \equiv t'_A - t_B \rightarrow t - t \rightarrow \mod 0 \tag{48}$$

This directly shows that, from the Einstein's equation $t_B - t_A = t'_A - t_B$, we can't derive the case of traveling at all, because from $t = t$ follows $t - t = 0$, or in Gauss modulo, $t \equiv t \rightarrow t - t \rightarrow \mod 0$.

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

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

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

And from these are following possibilities:

1. If $t_A = t$, or Gauss's notation $t_A \equiv t \rightarrow t_A - t \rightarrow \mod 0$, we have Galileo's relativity;
2. If $t_A \neq t$, or Gauss's notation $t_A \equiv t \rightarrow t_A - t \rightarrow \mod n$, we have Einstein's relativity or the Twin Paradox:
   a. If $t_A < t$ or Gauss's notation $t_A \equiv t \rightarrow t_A - t \rightarrow \mod (-n)$, we have the Einstein's case of the twin paradox when the cosmonaut brother upon return is younger than his Earth brother, Eqs. (35-36).
   b. If $t_A < t$ or Gauss's notation $t_A \equiv t \rightarrow t_A - t \rightarrow \mod (n)$, we have the Abramovic's case of the Twin Paradox when the cosmonaut brother upon return is older than his Earth brother, Eqs. (46-47).

5. Explanation of the Calculus

According to Einstein's relativity principle [1], the time t_A of the stationary system must be measured over time t of the system in motion, and vice versa. So the calculation is:

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

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

6. Personal Note

Going deeper and deeper into labyrinths of Einstein's soul, which I found much more philosophical and poetic than scientific, I have finally understood what happened to him: He indeed discovered completely correct mathematical models for everlasting present or as he called it, simultaneity. They were arithmetical zeros corresponding to non-dimensional geometrical points. But, enormous social promotion of his theory 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. A 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 (having no parts).

We should comprehend the present time as the fundamental natural law which governs the change of the world of things (space or energy and mass). This would mean that in physical reality there are no time intervals as we imagine them, because in the Universe there is no flow of time. The present is constant (physical eternity).

Why then do we have the impression of the time flow? It is because the basic continuum consists of unequal parts subject to a synchronicity law. The inequality of electromagnetic entities (space, mass, etc.) creates non-synchronicity or motion, a purely temporal phenomenon. The notion of force should be substituted in physics by the Time Law, as proposed by N. A. Kozyrev's **Causal Mechanics** [3].

Proof: Dear reader, when you began reading this paper, 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).

[3] N. A. Kozyrev, **Causal Mechanics** (Leningrad, 1991).