Are space and time equivalent measures?

Till Meyenburg, Raderthalgürtel 9, 50968 Köln

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Content:

I) Introduction

About hundred years ago, there was a great revolution in physics. This revolution was initiated by two great persons: Albert Einstein and Max Planck. The main thoughts and axioms should be taken in this article to be put together and to be developed.

Albert Einstein published in several steps his theory of relativity. He had two non provable axioms in his thoughts. The first axiom is that nothing is faster than the speed of light. The second not provable fact is that nothing stands still. From these two facts Albert Einstein developed his theory and his great laws. The greatest of all may be the equivalency of Energy and mass considered in the equation:

$E = m * c^2$

The second great revolution leader was Max Planck. Although he never was very confident of what he found out, he has revolved great truths. He explored that the reality is not a steady spectrum but that it comes in impacts. Although there are many great ideas of Max Planck, this article concentrates on his facts about space and time.

Max Planck found out that space and time are no steady spectrum, too. There exists an elementary length and an elementary time. Every length and every time that exists in nature comes as a multiple of these two units.

On these revealing facts that still belong to the important truths of modern physics this article refers.

II) quantum physics

a) General

The quantum physics have changed the modern life of physicians in the whole world. On this theory worked many great physicians like Planck, Heisenberg, etc… As given in the introduction this article refers to the fact that space and time are not a steady spectrum, but are multiples of one basic unit.

Although this fact is famous there is no equitation in which this truth is summarised. The idea now is to make an induction of the two equations:

Space = Planck elementary length * natural number
Time = Planck elementary Time * natural number.

That is the best way to be sure. It is the idea that space itself comes in impacts. Every existing space is a multiple of the Planck elementary length. Multiple are displayed in a mathematical speech as a natural number. The same must be with time. Time is a multiple of the Planck elementary time.

b) Induction of space = Plank elementary length * natural number

Induction is a mathematically method to prove equations with a natural number in it. It consists of the induction beginning and the induction step. In this article the number 0 is excluded so we begin with the natural number 1.

The hypothesis is mathematical written:
$s = e(l) * n$

The set of spaces is S:
$s \varepsilon S$

So we begin the induction with the 1:
$n = 1$:

$s = e(l) * 1$

A number multiplied with the natural number 1 is after a Peano-Axiom the number itself.

$e(l) * 1 = e(l)$

$s = e(l)$

So we see that a member of the set of spaces is the Planck elementary length. This is according to the quantum physic. One can state that the Planck elementary length is part of the real space and not only a possibility of a space:

$e(l) \varepsilon S$

The next step in an induction is that we conclude from the statement for n on the statement of n + 1

n -> n +1:

So we put it on our hypothesis and get:

Case n:
s = e(l) * n

Now we take a Planck elementary length and add it to both sides of the equation:
Case n +1:

s + e(l) = e(l) * n + e(l)

On the right side is two times the Planck elementary length. So we can use the axiom of Distribution:

s + e(l) = e(l) * (n + 1)

If it is now convincible that a Planck elementary length added to a space is also a space we can say that the case n + 1 is fulfilled. The Quantentheory says that the difference between two spaces is the Planck elementary length. So we see that every space with a Planck elementary length added is also a space.

s + e(l) ε S

So we can conclude that the statement:

space = Planck elementary length * natural number

is true for every natural number from 1 until infinity.

c) Induction of time
Now we can apply the same method to the Planck elementary time (= e(t))

Plank elementary time * natural number

Now there is symmetry to the time. Time is no steady spectrum, but comes in impacts, too. These impacts are moments. The 0 is excluded once again and we start our induction with the case n = 1.

The hypothesis is:
t = e(t) * n

The set of times is T:
t ε T

n = 1:
t = e(t) * 1 ⇔
t = e(t)

e(t) ε T is true.

Now we must induct from n to n +1:
n -> n +1

Case n:
t = e(t) * n

No we add a Planck elementary time on both sides of the equation:

t + e(t) = e(t) * n + e(t)

Now we apply on the right side of the equation the axiom of distribution:

t + e(t) = e(t) * (n + 1)

So we see that in the case of n + 1, the element is t + e(t)

The quantum physics say that every time to which one add an elementary time is also a time. Time comes in these impacts.

t + e(t) ε T is true.

So we see that the equation:

time = Planck elementary time * natural number

is true.

III) Equivalency of space and time

a) theory of relativity

i) General
Einstein based his theory on two axioms. These axioms refer to the speed. From these axioms he developed his whole theory.

ii) axioms of speed
Albert Einstein had two axioms. The first was that nothing stands still, therefore in my opinion the speed v = 0 is excluded. The second is that there is no greater speed than the speed of light. So we can exclude v > c. These two basic axioms are very important for our next proof. We try to prove that the speed is always the speed of light and that space and time are equivalent measures.

b) Putting the two equations of space and time together
Now we have two equations, one of time and the second of space. So we see that both measures are dependent on a natural number. It is very simple to put them together.
I. s = e(l) * m
II. t = e(t) * n
So we divide the first equation through the second.

I / II s / t = (e(l) * m) / (e(t) * n)
Space through time is the speed: v = s / t
Furthermore Planck elementary length divided Planck elementary time is the speed of light as defined by the heroes of quantum physics: e(l) / e(t) = c

So we have the equation:
v = (m/n) * c

But we have to exclude the fact that both natural numbers are not the same, as given by the mathematics m and n.

c) Space and time develop the same way
This article is based on the thought that space and time develop the same way. So it is necessary that we prove in our equation that the imaginable m and n are the same, so that m = n. Therefore speed is always the speed of light. That would be equivalent to the fact that space and time are equivalent measures. The suitable equation is: s = t * c.

d) Induction
So we have the hypothesis
m = n.
To prove this hypothesis we try to prove that m<n and m>n is false, so m =n must be true.
Hypothesis: m > n
If m > n would be true, the division between m and n must be greater than 1.
m /n > 1
If we put this into our equation v = (m/n) * c, we see that v > c would be true.
This is contrary to what Einstein said. He said that there is no greater speed than the speed of light. Therefore we see that the hypothesis m > n is contrary to one of the basic truths of the theory of relativity.

No we take the case that m<n. This is more difficult. So we take our good old induction. We put this induction for the case m = n and prove that the case m < n is false. The induction is for n.

n = 1:
v = (m/1) * c
As we have proven m cannot be greater than n, there are to possibilities if we assume that m could be zero.

m could be one. That implies that m = n as we want to show.

Let us take the case
m = 0
If m = 0 we have the case that the speed is v = (0/1) * c. So the speed would be zero. This is also contrary to the theory of relativity. As after the theory of relativity nothing can stand still so the speed v cannot be zero. So m cannot be 0. It also cannot be greater than n so that for the case n = 1, m can only be 1 too.

m = n

So we make the next step of induction:
We assume m = n and try to prove that for n + 1 is also right.
When this article was written I thought that this would be the main problem. As I would have to prove that every difference of speed could be reduced to the case n = 1. Sounds difficult? I thought too. But I made this proof and I noticed that I simply had to add a 1 to prove the case.

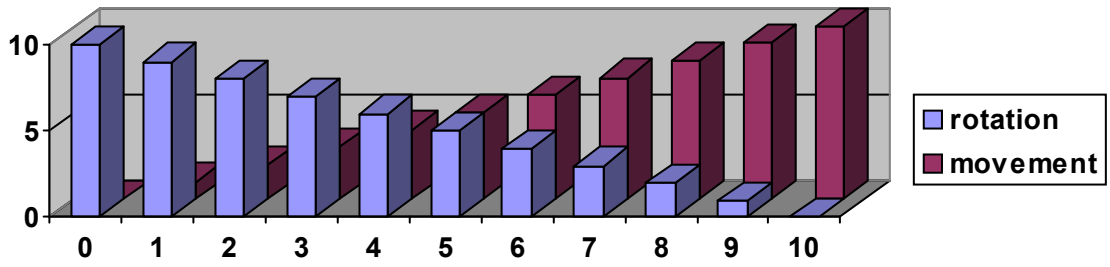
$m + 1 = n + 1$

Therefore we conclude from the case n to the case n + 1.

So we have proven m = n. Now we put this in our basic equation $v = (m/n) * c$. So we get $v = c$. This is equivalent to $s = t * c$. We see that space and time are equivalent measures, as energy and mass, proven by Albert Einstein.

IV) Speed is always the speed of light
So we have v = c or spoken speed is always the speed of light. As Platon assumed we have to differ between the rotating and the forth speed. As we take a ball which is rotating and moving forward, we see that rotating and moving forth is like a right angle triangle. Using Pythagoras and state that the square of rotating speed and the square of moving forward speed is always the square of the speed of light:
$(v(\text{rotating}))^2 + (v\ (\text{forward}))^2 = c^2$

To prove this, there are two relative fix points. One for the rotating speed is the middle of universe. It rotates with the speed of light and does not move forward. In our hypothesis this is used as a relative fix point to forward speed. As we move relatively forward, to the middle of the universe, our forward speed is absolutely. As a relatively static point for rotating speed there is quantum that moves forward with the speed of light. It does not have any possibility to rotate. This means: Light has no rotation. So light itself is the relative fix point to rotating. The way we rotate relative to light is the way we rotate absolutely.



V) Energy and work are the same

In the whole century after Albert Einstein proved $E = m * c^2$ there was a discussion about energy and work are the same. With our new created images of space and time we assume

that work and energy are the same. As we see that space and time are equivalent measures it is obvious that work and energy are the same too. Former physicians thought that there is a difference between $E = m * c^2$ and $W = m * v^2$. But we see that speed and the speed of light are the same so we conclude that energy and work are the same too.

VII) Impacts

There are several impacts brought by the new law v = c. We will see that energy = mass * the square of the speed of light is always right. In all cases. Now we conclude from this the mass conservation law. In the second part I will have a wider conclusion from this new law.

a) mass conservation law

We know that energy is conserved in a closed system. As we now see Energy and mass are really equivalent in all cases. It is concluded that mass is conserved, too. In equations:

I) $E = \text{const}$
II) $E = m * c^2$
II in I) $m * c^2 = \text{const}$

As we assume the constancy of the speed of light and also the constancy of the square of the speed of light. So we see that in a closed system it is right that mass is a constant value divided by a constant value. A constant value divided by a constant value is also a constant value. As we take as example. We have 4 and 1 and they are cons. So the division 4 / 1 is always 4.

So we conclude that mass is constant in a closed system.
$m = \text{const}$

What directly comes out of this is the fact that light has a mass. We take the so known mass defect. It says when a fission is made there is always Gamma-rays. The energy of the Gamma-rays is taken out of the system and the resulting mass of the two new elements is less in the way the Gamma-Rays have energy. If we assume a conservation of mass we see that the Gamma-Rays must have a mass. As Gamma-Rays and photons are the same we see that photons must have a mass.

b) Thoughts on the new law

We see that space and time develop the same way. Our mathematical proof is in some kind not quite right. Mathematical proofs exist in every time from the beginning till infinity. But our law is developing in each time we live. Let us take a number. We are 7 billions years from the beginning and our space is as equivalent big. But it is not infinite. It develops as I write this article.

Let us come back to Albert Einstein. Einstein thought that the universe is developing at the speed of light. This may be true from our law. But it is not a direct conclusion as we have seen that one have to differ between rotation and forward speed.

But there is still a chance that Albert Einstein was right!