

Uniform length measurement method corrected a failure caused a violation of 2-d postulate in Special Relativity

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A logical reasoning problem in the Special Relativity interpretation of the Lorentz transformation was discovered and corrected by introducing an alternative interpretation of Lorentz transformations with a relativistic measuring process based on both, stretched time and length units, whereby the measurements as a consequence measure a shortened distance and time lines as variables due to used units. The space shuttles are getting longer instead of shorter and a barn-pole paradox does not occur. The failure is that by contracting both units and distance the Lorentz factor is eliminated and relativity was vanished. This leads to a discovered invariance of speed of light contradicting 2-d postulate. The elementary particles have their own measuring devices for time and length in the form of wavelengths and frequencies and they read distances and durations of different lengths from space using their own relativistically different units. This is an astonishing result too in view of all dramatic and romantic history as there is really a failure discovered. The new theory and the discovered problems of logical failures are explained vividly in the same manner as Special Relativity was using in easy be thought samples. Reader do not need a high level of mathematics to be fit for as it is a more qualitatively philosophical thematic for every one who is interested in relativity matters.

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1. Motivation

Every one knows the relativistic literature romantics about time dilation and that is again a reason to look at. The heated historical debate about Einstein's *Special Relativity Theory*, SRT, an interpretation of the Lorentz transformations was only conducted from the point of view of *negating the relativity*. Hence, no one thought of the third possibility, now discovered by chance - that the relativistic is real, but Einstein, Lorentz and Poincare may have misinterpreted it. Or they could be more then one suitable interpretations too, which we prefer to think at start.

It was a sudden discover and solution of a really one deep logical failure in the SRT's interpretation of a measurement of the length, which is now changed using stretched relativistically length units in order to measure viewer units as a contracted again distance between two space locations. This hypothesis we prove here.

2. Discovery of an alternate interpretation of Lorentz Transformations besides SRT

We think of the following thought experiment in space with several fast spaceships. A route is set up between space stations A and B with quasi "fixed space locations", but there are spaceships of different generations, each with a different speed, with Lorentz factors γ_1 , γ_2 and γ_3 .

Each of the 3 has read out a different distance AB in the same space between the same locations in its own Inertial Frames, IF: AB/γ_1 , AB/γ_2 and AB/γ_3 . It is completely the same and even to each of the 3 spacemen what the others had measured - they measure it independently of each other. AB was measured in earthly inertial frame, IF. Because the faster ones arrive earlier, they wait for the ones to come later and it happens. Although it takes a longer distance, all three arrive at the same destination, brake there and get off. They all started from A and all ended up in the same localisation B. We of course do idealise this experiment as they always are to think of, because all cosmic bodies are in movement, but in a large scale of distances and high speeds we can approximately mean, that a location of a star planet system is likely to be in same space place. And we could let the waiting space shuttles to use rocket engines to stay at same location in space too.

From this starting we can already see that places A and B in space must have remained the same. Spatial locations do not shift in order to adjust the traveller's routes relativistically. How can it be then? These spatial locations A and B, as ponderable masses of planets, are also events that are Lorentz invariant.

The only possibility is that everyone had a different measure of length with which they read this distance AB from space. Consequently, the measures of length, and also the measures of time, thought logically, must be adapted relativistically.

How can one count a fewer length units, of meters in the same space distance AB? Well, if the meter or any length unit gets *longer*. Stretched.

But the SRT tells us to contract all lengths including especially the length measure units too. So who is right? We know how the answer of physics is at this moment.

The time dilation means, as we continue, that the 3 travellers had a time-dilated heartbeat compared to earths IF. The period is increased, enlarged, dilated. If you send a signal to earth for every heartbeat you can mark the corresponding point in space. Between the 3 travellers there are distances of different lengths between heartbeats. We could also use an atomic clock as a pacemaker. The larger the Lorentz factor gamma, the slower the heartbeat and the longer a heart-beat space segment that can be used as a measure unit of length. So less of such longer heart-beat space segments will fit between A and B fit in the faster spaceships IF causing a shorter measured distance. We will lead the reader to that understanding about how particles periodic "heart beating" and moving is producing our time flow in dependence of the speed.

Who wants to shorten the reading of step by step details can just have a look at Fig. 2 and 3 and compare and understand all by himself.

3. Distance Measurement according to SRT and discovering that failure of SRT's interpretation of Lorentz transformations

3.1. "Moritz calculation"

Moritz was in 4-th class as his brother told him about the Special Relativity, that every length in the

moving direction has to be contracted, both distances and length units too. Moved bars and space shuttles, planets. They did look at amazing animation videos about that.

Moritz was good in arithmetic's and did calculate so:

a given sample distance he thought between two locations in space A and B

$AB = 1000 \text{ [km]}$, in the length units of earth's unmoving inertial frame in $[\text{km}]$,

and a Lorentz factor to be easy to calculate $\gamma = 2$.

Then he calculated a new relativistic length unit according to the told rule of SRT by the obligatory length contraction

$$\begin{aligned} & [\text{km}'] = [\text{km}] / (\gamma = 2) = 0,5 [\text{km}]. & (1) \\ \text{And therefore} & [\text{km}] = 2 [\text{km}'] \end{aligned}$$

The new distance then would be

$$A'B' = 1000 [\text{km}] / (\gamma = 2) = 500 [\text{km}], \quad (2)$$

but still measured in old “unmoved” length units in $[\text{km}]$.

And now Moritz was able to substitute to get the distance in new units $[\text{km}']$

$$A'B' = 1000 [\text{km}] / (\gamma = 2) = 500 [\text{km}] = 500 \cdot 2 [\text{km}'] = 1000 [\text{km}']; \quad (3)$$

And he has got again the old number for that distance in new length units. It was again 1000 $[\text{km}']$, but in that new shorter contracted units $[\text{km}']$. And in the moved frame no one can recognise a difference, so this distance is same as before, nothing shorter.

His brother told it to his teacher of the 11-th class and was hesitated asking, if there was a failure? The teacher answered “if Your little brother would have right, then the SRT must be wrong and that cannot be”.

We resume instead that this is the shortest explain of the failure in SRT. If one is contracting both, length unit and distance then it eliminates all relativistic contraction by $\gamma / \gamma = 1$ at all and that exactly happened to the SRT authors. They didn't meet a Moritz.

Moritz then did in the 5-th class a further development and found a conclusion:

if the length unit would be stretched instead of contracting, then it will lead to a contraction of a measured distance. It is only necessary one time, not two times, to use Lorentz factor γ on the length unit and then to use it for the measurement.

$$\begin{aligned} \text{Stretching unit:} & [\text{km}'] = [\text{km}] \cdot (\gamma = 2) = 2 [\text{km}], & (4) \\ & [\text{km}] = 0,5 [\text{km}'], \end{aligned}$$

$$\text{Measuring distance: } A'B' = 1000 [\text{km}] = 1000 \cdot 0,5 [\text{km}'] = 500 [\text{km}']. \quad (5)$$

It is even shorter and easier method as he just did not use Lorentz factor γ on the distance self, but

substituted the units. Now he know also from his brother, that for the time dilation it was exactly so used in the SRT too and this satisfied him in thinking that he was discovering an astonishing fact. Being just a scholar in 5-th class he became a significant theoretic physicist with a shocking the world result.

As in Moritz was also growing a little philosopher he concluded that $AB = A'B'$ and the locations in space do not move due to the movement of the inertial frames.

And to write it he proposed to differ between units and measured values now more exactly.

$$l = N_L \Delta l. \tag{6}$$

with Δl standing for length unit and N_L for the distance number as a scalar without units. l is the distance with units as we use it usually setting it in mind equal to N_L . This didn't differ the authors of SRT and therefore did not recognize the failure, which was for a century not recognized.

The distance therefore Moritz defined to be a scalar number of length units fitting between two locations. And only length units and other units are objects of relativistic interchange with space according to Lorentz transformations, while all measured values are just a summation of that units.

3.2 Graphically the measurement method of SRT

In SRT there is a requirement to contract all lengths. This is a procedure and is used. It does not just follow from Lorentz transformations. An earthly known distance $AB[m]$ means that we know how often the earths meter between A and B fits.

Consequently, a distance measured in the Inertial Frame of a traveller would also be $A'B'[m']$ in meters m' of the traveller, no longer in earthly meters m .

Now we follow the SRT and contract and see that it has stayed within meters of earths m . Then where are IF's own relativistic meters m' ?

$$A'B' = AB[m] / \gamma \tag{7}$$

This is to see in Fig. 1 b) after applying the SRT contraction method to the previous situation in a).. And SRT says that the on-board meter also contracts to:

$$[m'] = [m] / \gamma \tag{8}$$

Shifted

$$[m] = [m'] \gamma.$$

This contacted meter m' is standing alone for itself and is not used to measurement of distance as we see in b)..

That step c) did little Moritz above but never did the authors of SRT.

And we think we have to somehow to get the relativistic meter into (7) properly so that our measuring method is correct again. We use.

$$A'B' = AB [m' \gamma] / \gamma; \tag{9}$$

Because gamma is a constant factor for the current IFs, we can take it from the unit.

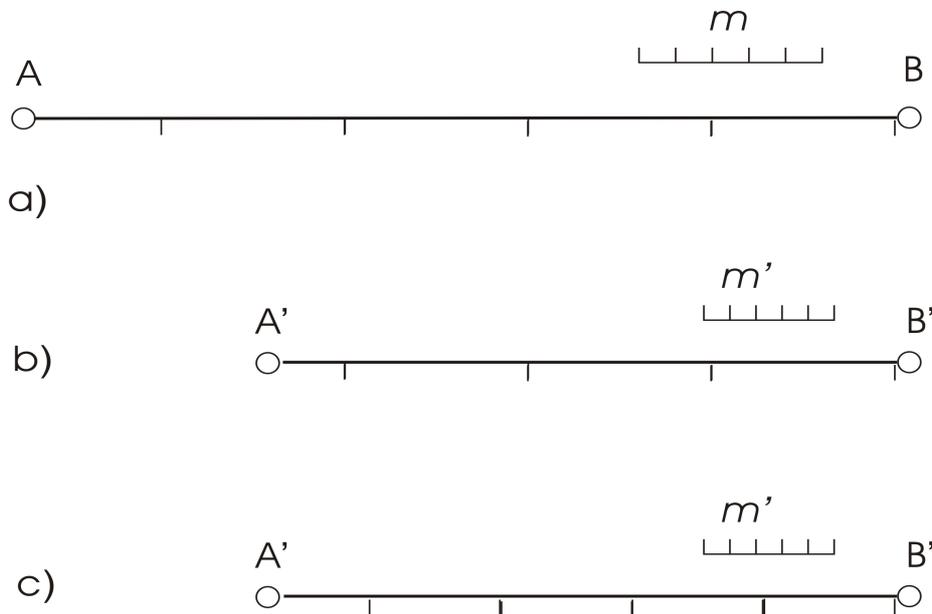


Fig.1 Distance Measurement according to SRT in b), and the avoided step in c). with the failure

$$A'B' = \gamma AB[m'] / \gamma = AB [m']; \tag{10}$$

And get that A'B' is the same as AB, but measured with new meters m' . We have already given up his gamma, both gammas are abbreviated. What is there now? If we now think unnoticed, we measure the AB with m' and get the result. AB hasn't changed, but m' is contracted?

In the case when it is thought contracted again, we get more short meters m' between $A=A'$ and $B=B'$, so the distance increase instead of contracting. Or in the case, if we leave it equal to earthly meter m , we get back the earthly distance.

The logic is that the correct result of the contracted distance from (7) comes about through a wrong procedure, in which one has measured with earthly meters. Then you go there and also choose the meter. But one also forgot to use it. The two gammas would then cancel out each other as in Moritz calculation.

In Fig.1 b) we see it graphically in a more didactic way that the A'B' were contracted, bur the old units tell as the viewer relativistic number of units fitting between A' and B'. And besides that independently the length unit was contracted too, but not used.

In Fig.1 c) we see that avoided step of the method of SRT, which Moritz discovered. We have to drop old unit m and instead to use the new contracted unit m' to find out how many times it will fit between A' and B' . And voila – we get graphically again old number of units fitting between A' and B' which we see in Fig.1 a) before starting that method. We read same distance as in primary IF but just we squeezed the space together with the units like an elastic rope.

Also we see graphically that location A was moved in space and why not B no one tells.

3.3. Muon case study

In Fig.2 we see a typical image of the relativistic case of atmospherically Muons as can be found in many standard literature courses [1] teaching Relativity of SRT.

We have only marked the start and end points of the Muon route with A and B and the mountain peak C in space. As you can see, these points were shown offset in both Inertial Frames. For undisclosed reasons and motivation, the lower end point B was retained and only the upper point A and C' moved in the space in order to contract the entire space.

Are the points A and B no longer in the same spatial locations for all Inertial Frames? Do two events take place at two different locations A and A' instead of one? Any number of Inertial Frames can be derived with different Lorentz gamma - and then there should be an infinite number of new displaced locations of the mass particles and other “contraction centre locations”? Does it physically move the locations in space? If so, how it is with the mass of matter?

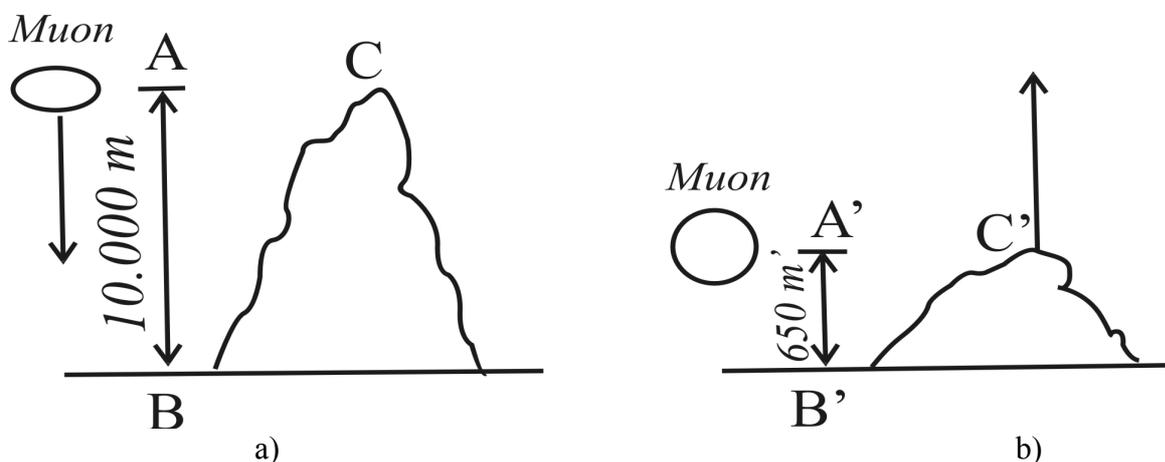


Fig. 2. A common representation of the length contraction a Muon track in the atmosphere represented from an university standard teaching materials [1]: a) earths Inertial Frame, b) Muon Inertial Frame.

We refer to the discussion above about the same spatial locations that go nowhere. It is the traveller who actively do something and all travellers did meet in the same space location.

Projection or mapping of the distance AB to A'B' between the two Inertial Frames in Fig. 2 is produced by the method of SRT shortening (contracting) both the distance and the length unit. It

means that the relativistically contracted distance A'B' is after this method just having 10.000 km' again, only measured with shorted (contracted) length unit' the shorted distance'. It is like a rubber tape with length units marks on it, when after contracting it will keep the number of marks and the result of measurement will stay the same, eliminating the contraction or stretching on both units and the whole distance.

This is easy to test: if that mapping has place as shown then we have 650 m' to set equal to 10.000 m in earths IF, so the rate would be $\rightarrow 1 m' = 15 m$ and then it is a stretched length unit. But the SRT tells the opposite direction to divide for contracting and means for the length rate $1 m' = 1/15 m$.

If we insert that SRT contracted length rate $1 [m'] = 1/15 [m]$ into $650 [m']$ we 'l get

$$l' = 650 [m'] = 650 / 15 [m] = 43,33 [m] \quad (11)$$

This is as we did two times Lorentz factor used dividing on the distance l , where Δl is for length unit.

$$l' = l/\gamma \cdot \Delta l/\gamma = l/\Delta l\gamma^2 \quad (12)$$

This is different as the first interpretation above where it was cancelling out Lorentz factors in an graphically model of SRT's measurement method.

This is the consequence of that discovered logic failure leading even to two different but both wrong results, if trying to interpret logically. By Moritz calculation the distance A'B' stays 10.000 [m'] in new contracted meters, which is also wrong.

A reader may use any one of standard literature on Special Relativity Theory, the SRT [2] to get enough knowledge to be fit for this lecture.

3.4. Muon and the new measurement of distance by stretching the unit of length and time

A Muon lives longer and moves on with relativistically stretched measures of length and time. The Muons in the atmosphere are almost as fast as light, live and travel 10 km instead of 650 m, which corresponds to a gamma-Lorentz factor of approximately 15,4.

In Figure 3 it can be clearly seen that the terrestrial observer sees the Muons lifespan AB as 10 km, while a spaceman travelling at the same speed with the Muon sees his Muon lifespan as his "own normal" A'B' with 650 m'. Consequently mapping in space 650 m' between the same space locations A=A' and B=B' at the beginning and end of the route of the Muon to the 10 km distance seen from the earthling, so that the unit length of the Muon stretched in terms of the earth by Lorentz factor. Instead of to be contracted according to SRT.

As contracted, the Muon spaceman measures the distance AB instead of earthly 10 km as his own 650 m' in relativistic Muon meters m' , which apply in his Inertial Frame. 1 Muon meter $1 m' = 15,4 m$ in earth meters. With horizontal lines we have divided the distance 650 m' to approx. 100 m' , which corresponds to 1540 m on the earthling side. As you can see, it is a projection or a direct mapping the Muonic 650 m' to the 10 km of the terrestrial spatial distance AB. In a third IF a third relativistically measured distance measurement is obtained with a third straight relativistic length dimension but between same locations in space.

The spaceship of the Muon spaceman is measured by him as normal with his own Muon's meters m' and consequently the spaceship is also *elongated* - not contracted! The distance AB can also be measured in spaceship lengths as an unit of length and only then after converted into Muon meters m' . The space ship is itself an unit of length.

The 650 m' Muon's lifespan for "normal length" results in the well-known examples if an almost light-speed of 98% is classically multiplied with the mean lifespan of 2.2 μs , as it is called in the well-known representations [2]. However, since a "normal Muon" can be slower, this distance has to be even shorter and then the Lorentz gamma would be much larger. However, this does not change anything in the fundamental statement of the relativity. Some sources also mention a gamma of 50.

From Figure 3 it can be seen directly that the Muons lifespan was *stretched* from the own 650 m' compared to the Inertial Frame on earth to fit the 10 km of earths IF between the space points A and B. So not contracted! The measured distance A'B', which an earthling sees as 10 km, was not "contracted" but was "read out using another stretched length units" with result of viewer such units could fit between A' and B'.

So the wording "contraction" did play a game to all physicians for 115 years. That is, the words are influencing the thinking.

Let be a classical measurement of a distance between America and Europe in miles and in km. The numbers figured due to different units are different, but the spaces "really distance" stays same.

With time dilation we proceed in SRT already in exactly the same way by *stretching the time unit*, calling that dilation which means enlargement. Then afterwards viewer of such longer time units did deliver the measurement result of the younger twin.

One can clearly see in the Fig. 3 that the actual spatial locations A and B in the space remain the *same* in both compared IF's. If we could, one can also perceive the same spatial locations from an n-th IF, but reading the distance $AB = f(\gamma)$ with its own relativistic units of length in numbers differently than $(AB)'$, $(AB)''$ etc..

That is a very important finding showing that the spatial locations and space remain the same, i.e. the space is not compressed or stretched. → The moving matter particles just "read" the space differently, relativistically with IF's own units of measurement for length and time (and mass). Therefore they have wave length and frequencies and this is what is changing relativistically on elementary level of matter. Our macroscopic clocks and meters and miles are composed of and mapped to the particles wave lengths and frequency's.

We can also conclude, that the Muon was in points $A = A'$ and $B = B'$ simultaneously as an invariant event himself being there. How different the information travels different time to somewhere due to different distances and IF's is another question raising after that. In Fig. 2 one could think that this are 2 different points in space time with $A \neq A'$ and $B \neq B'$ and they are then two different realities about 2 Muons as events instead of one. We must contradict this interpretation of reality as invariant in Lorentz transformations. Fig.3 explains at a single look how relativistic contracting distances works even if it was not the starting point of present discovery. The stretching of the moving objects is meant physically really of course.

But at the end, the space traveller will see the earth again due to his longer length units contracted as similar like in Fig.2 b) but because he self was stretched. The moved sees the static contracted and the static sees the moved stretched. If we don't ask how the "moved" and "unmoved" are to differ, it works with the same known dump rule of SRT in time dilation being adopted to the twin paradox.

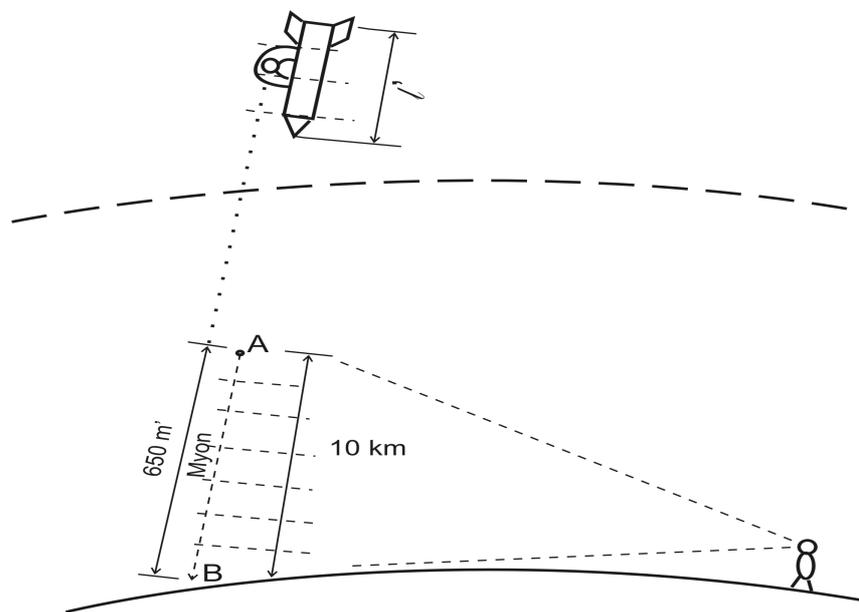


Fig. 3. A relativistic Muon and space shuttle observed in the earth's atmosphere from earth's Inertial Frame.

In SRT it is not possible to conclude that $A = A'$ and $B = B'$ because then it would lead to our conclusions here in mapping the distances according to Fig. 3. Consequently the author of SRT is interpreting, but never telling it open and willingly, that the space locations A and B are moved to another A' and B' by the relativistic process and that would have to be for each of infinite number of IF's of each elementary particle in universe. And this must lead to same question we asked above, where is that centre of such squeezing of space? Starts it in A or B or on bord of space shuttle or in centre of the galaxy and then of which of galaxies? Where it have to begin?

You see that question is leading to a nonsense and therefore only that mapping $A = A'$ and $B = B'$ works true. Locations do not move in space. If You accept that, every thing left is easy. This is the point of contradiction to SRT.

3.5. The new relativistic length of the space shuttle

The length l' of the space shuttle can be clearly read out graphically in Fig. 3: the lines with the units of length m' of the Muon's IF show that it has an intrinsic length of approx. 400 m' . Consequently it is also stretched and is measured stretched by earths people with gamma $\gamma = 15$ to about 6000 m on earth. According to SRT, it should be measured to be 26.66 m contracted for earthly IF. The difference is a failure of squared Lorentz factor γ^2 .

Every relativistic spaceship has its own space length in its own IF, measured with IF's own length measure units m' . We assume that this unit is set to 100 m' length in figure 3. Because every meter' is now *relativistically stretched*, from the relativistic point of view of the earth IF, the length of this ship is also *stretched* for the earths IF. Elongated instead of shortened according to SRT. With Lorentz gamma 15, the earthling sees the 100 m' of space shuttle as approx. 1500 m long, measured with the earthly unit m . The shuttle self can serve as a length unit for measuring distances in space – it is because the relativistic basics do build the particles and they are getting stretched in wave lengths. And they do not break from each other!

This new relativistic interpretation solution of Lorentz transformations applied to the measure of lengths is unambiguously and equally unequivocally assessed asymmetrically from both IF. The spaceman in the "Muon spaceship" sees with his stretched meter m' unit measured all earthly objects in his direction of movement as contracted because less of his length dimensions fit inside. In opposite direction the earths observer will see the space ship stretched measuring it with his shorter length units.

So it is clearly assessed relativistic *asymmetrically* and the famous “barn-pole paradox” does not appear at all. And we got like for time dilation same asymmetry between compared IF's.

3.6. Difference between units and distances

What is the difference between an unit of length and a measured distance?

The measured distance is a product of the unit with a numerical *value* without unit, which is a counter of how many times the unit fits in between of any two points in space. So, the units we change only one time and then we measure with them an infinite number of distances within our new IF. This was the philosophical difficulty in the present case of relativistic theories. We have too much common use daily experience with units and distances and so we do not recognise how to divide it exactly. Some one will say it is an easy piece of thoughts, but history shows another side.

The units are relativistically to be stretched in moving IF, if transforming from a relativistically lower to a relativistically higher IF and vice versa. And distances are to measure after that with those relativistic changed units to find out the numerical scalar variable value of a measured distance. Even if the result is true when we just did directly contracted a distance, behind that is this measurement mechanic. A macroscopic sample model we have if we measure same distance with miles or km getting different variables.

The same is true for time units and measured time segments or lines, just it is a more abstract entity and is to handle using a speed of movement to connect distances with time. In our case the speed of movement is speed of light for photons and speed of observed IF's for moved mass particles.

3.7. New measurement method using a stretched length unit graphically

In accordance to Fig. 1 we can see the new method figured out in Fig.4. This is graphically what the Moritz above did.

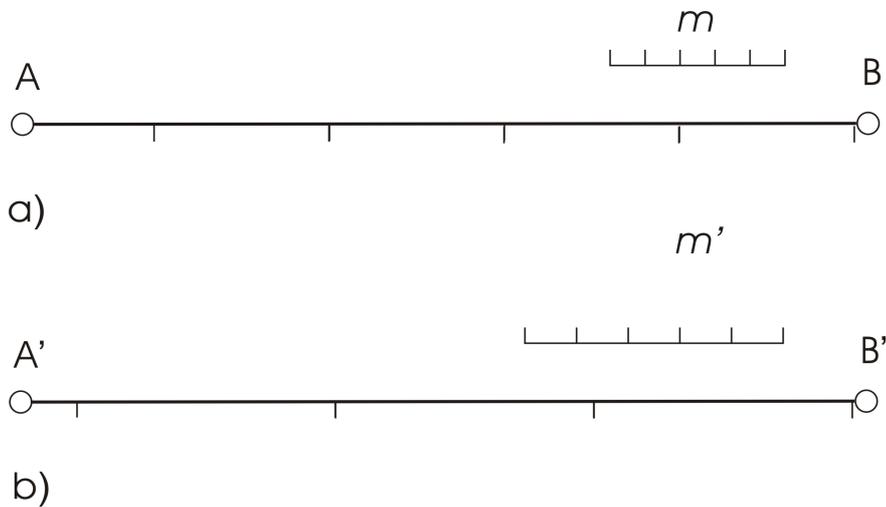


Fig. 4 New measurement method using stretched length unit $m' = \gamma m$.

We have first to relativistically change by stretching the length unit and then to measure with it the same distance AB between same locations, which are staying unmoved in space for all inertial frames, how many of them will fit in that distance.

4. Without the “barn-pole paradox”

We can see how the old good “barn pole paradox” is avoided in the present new interpretation of Lorentz transformation, explained in Fig. 5.

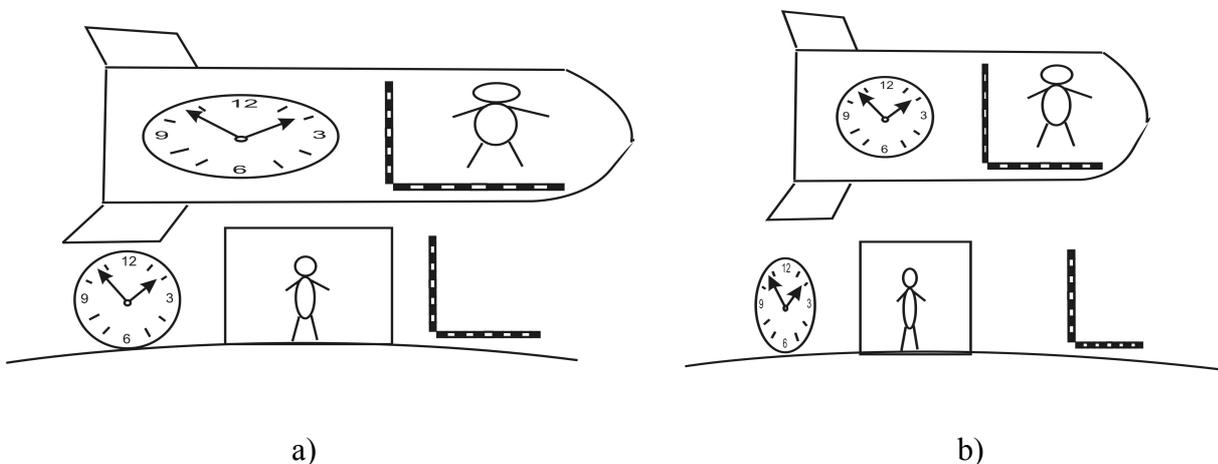


Fig. 5. A new situation free of a “barn-pole paradox” a) in earths IF, b) in space IF both asymmetrically different.

In Fig. 5 a) the earths observer can measure with his normal length meter m and time $sec.$ units, that the units of the space shuttle $meter', sec.'$ are stretched longer and he see the shuttle therefore also stretched and clocks slower, which we figured out as oval shaped.

n Fig. 5 b) in opposite observation the space shuttle observer is measuring with his for him normal units, that the length $meter$ and time units $sec.$ on the earth are relativistically contracted and so are also the mass of the bar and the men himself. The vertical dimensions are kept as in SRT. This is the new view in the present interpretation of Lorentz transformations.

To show more clear we use larger and smaller sized letters for moved an stationary IF's just temporary to make sure we do not lose the path.

We can write asymmetrically relations now for length and time units to be stretched with Δ standing for units:

$$\Delta l' = \Delta l \gamma; \quad \Delta l' > \Delta l; \quad (13)$$

in backwards compare direction reciprocally length unit

$$\Delta l = \Delta l' / \gamma; \quad (14)$$

The distance in space AB is as quasi “absolute” the same, so $AB = A'B'$, just it will be differently measured. The measured distance in a scalar value without units we name N' and N . This is later identical to l and l' , just to take care we did it didactically.

$$AB = N \cdot \Delta l = A'B' = N' \cdot \Delta l'; \quad (15)$$

$$N' = N \cdot \Delta l / \Delta l' = N / \gamma = l' = l / \gamma. \quad l' < l; \quad (16)$$

With N the distance measured in earths IF and N' distance scalar value measured in shuttles IF contracted as required.

For time in same method of measurements using units or periodic time stretching ΔT .

$$\Delta T' = \Delta T \gamma; \quad \Delta T' > \Delta T; \quad (17)$$

in backwards direction reciprocally time dilation as in SRT

$$\Delta T = \Delta T' / \gamma; \quad (18)$$

measuring an abstract “time space segment” between A and B $(AB)_t$ in analogy to distance

$$(AB)_t = t \cdot \Delta T = (A'B')_t = t' \cdot \Delta T'; \quad (19)$$

$$t' = t \cdot \Delta T / \Delta T' = t / \gamma. \quad t' < t \quad (20)$$

In (14) one can see that in “moved clocks” was less time $t' < t$ measured during the trip between A and B. The time t' measured in a moved IF counts viewer scalar variable number of dilated i.e.

stretched units then compared with static earths IF t during a trip between A and B. This result is what SRT is verbally telling us if the traveller twin stays younger, but was never written that clear way. SRT author and followers didn't understand to differ units and measurements. It is a philosophical point of view about space as one continuum and all what is possible in continuum was to stretch or contract it as whole including units glued on it. Now this view model will have no chance left.

A well known German youtube blogger and TV physicist J.Gassner, tells so in his SRT video on youtube something like that “one must place the Lorentz factor so that the moved clocks are slower and lengths are contracted to assure the right results, because it is too tricky”. A thumb rule.

So, we can conclude that the relativistic stretching the units is a physically relativistic phenomena itself, while a measurement is just the consequence of using that. The unit is one same in all particles being a constant for the given IF and distances are many of an infinite number as they are variables. And they are reciprocally proportional - if one stretches the other shortens. This is a very general relativistic rule for all in nature and therefore is strongly even to look at the measuring the mass too by same rule and the consequence would be that mass hypothetically must be also asymmetrical relativistic attribute as now time and length are both.

The variable equals the constant unit multiply with a variable scalar number to fit in between two locations.

For mass m by relativistic stretching units larger in moved IF we have a difference

$$\Delta m' = \gamma \Delta m; \quad \Delta m' > \Delta m; \quad (21)$$

and measuring process

$$m' = N \Delta m' = N \gamma \Delta m; \quad m' > m \quad (22)$$

Because N is here number of particles and this stays invariant and that's the difference to length and time, where it is a variable.

5. Time dilation and locations in SRT

In Fig. 6 is a typical image of the time dilation thought experiment taken from a SRT lexica [2, 3].

We can conclude an important fact, used apparently also by Einstein, that the space points A and A', B and B' are momentary the same in space in both IF. So why then to use them different as in Fig. 2 contacting the space? The points A and B are moved in space transversally and longitudinally too, but when a photon as a localisable particle is meeting at A then it is momentary same point in space for all IF as it is in B too. In this case Einstein used that and we can cite him for that.

In Fig. 6 b) also is clear to understand, that the length of the longer stretched hypotenuse AB' of the triangle is not a result of stretching or contracting the space. So we see in Fig. 6 b) a stretched wave length with respective periodic time also stretched. So where is a contracted space here? The number of wave crests n was invariant the same. This is same model as for transversal Doppler effect. This sample is very vividly as it can be seen that the length as wave length and the periodic time both were stretched and only so the speed of light can stay invariant. The photon itself is stretch not the space.

And they argue in the SRT literature [3] “which expresses the fact, that the moving observers period of the clock $\Delta t'$ is longer then the period Δt in the frame of the clock itself”. That's it! They did use the *period* time of the wave of the photon as an stretched unit calling it “clock”. Further they consequently did make a frequency as reciprocally of that period time of the clock and did receive the true red lowered frequency. We are discovering a mystified measurement process in details.

So it was happening in a time when all was new in relativistic physics and even during 115 years no one of the relativistic anticipates and fans too did find it out. All knowledge about Special Relativity is available in proven and developed didactically 100 years long standard literature available [2, 3, 4, 5].

We discovered now that length is asymmetrically too as time is. It was an over interpretation to postulate a symmetry in length contraction with $l' = l/\gamma$ and $l = l'/\gamma$ at the same time and now it is evident.

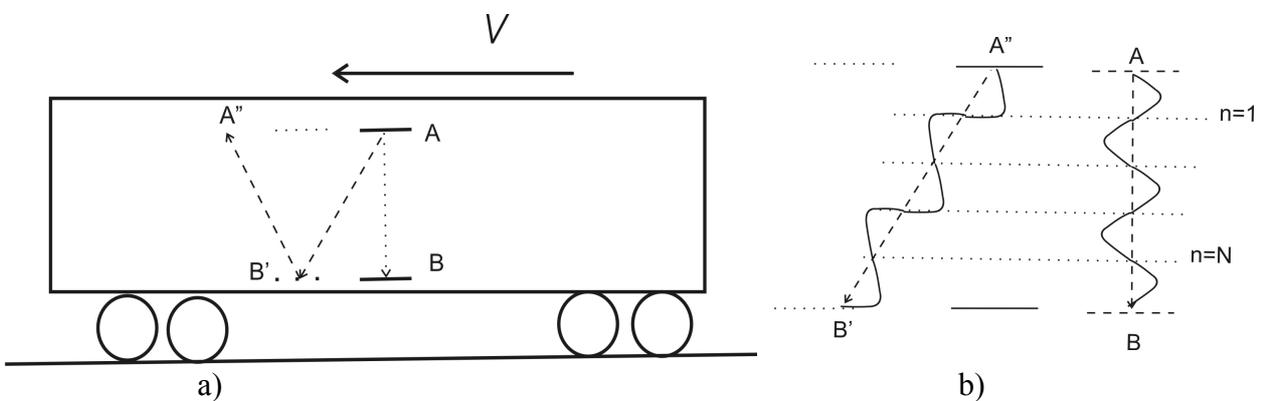


Fig. 6. Transversal light in a moved IF' seen from stationary IF at the rail station a) and a wave stretched transversal in b).

The new interpreted theory does fit both postulates, that speed of light is always constant and all physics law is same in all inertial frames.

6. Elementary particles as elementary Relativistic Measuring Means

How it happens cinematically has not yet been asked. But we know that all particles with wave properties do have periodic processes, such as wavelength and frequency, and these are suitable measuring devices that every particle always has on board. Our units of length and time are thus composed. Elementary it is precisely these properties that are the actual relativistic surveyors in interactions.

But we know by SRT, that by time dilation all periodical processes are at lower frequency's and atoms emit photons with a red shifted longer wave length. This is the effect of relativistic stretching the particles own *on bord* relativistic measurement units, which is a consequence of present explained new interpretation of Lorentz transformations and correcting the old SRT. The *de Broglie* matter wavelength of the atoms emitting such red shifted photons must be also red shifted and stretched in wave length, being a relativistic measurement units of the atoms and particles in it – as every periodical process is to be time dilated.

The *relativistic stretching of units* is the more elementary primary process at the level of elementary particles in interchange action with time-space. The measurement is then an using of this process.

7. Checking invariant constants for relativistically units as a test and discovering a killer argument against SRT

We discovered a method of analysing invariant constants, because the units are relativistically to be treated as a test between SRT and the new asymmetric relativity.

Speed of light c does have relativistic units for length and time $[m/sec]$, so that means in relativistic dynamic moved IF both relativistic attributes are to be treated each with Lorentz factor according to the theory in question. If we use our present new knowledge that units are to stretch, then we get

$$c[\gamma m/\gamma sec] \quad (22)$$

and eliminating them we get that c is independent of changes by Lorentz factor. That's true.

If we would use the SRT with contracting meter unit $meter/\gamma$ and stretching time unit as done with time dilation γsec , then we would get erroneous

$$[meter/\gamma^2 sec] \quad (23)$$

and a variable function of light $c'(1/\gamma^2)$ would be none constant.

These effect shows how relativistic units do work in making constants invariant in all IF's. They are working hidden eliminating each other. In shadow and invisible we didn't recognise them. But the units stay really relativistically stretched.

This is a sudden new argument never expected which contradicts the SRT directly and strongly irreparable. Even if we wouldn't have a working solution it would now be a killer paradox for SRT showing that there is a deep conceptional principle problem.

8. Definition of speed alone works too

Let us be even more direct like children. Just we can write up a relation for any speed as a ratio of a length segment Δl to a time segment Δt and set it to the constant speed of light c :

$$c = \Delta l / \Delta t = a \Delta l / a \Delta t ; \quad (24)$$

If one of two length l or time t changes due to relativistic, then the other must change linear proportional to keep c invariant. It does mean we must and can only take a constant factor a in denominator and in counter as in (24). And that is what we have done in new theory to see in (22) by stretching both units. In SRT the one variable, length, was contracted $\Delta l / a$ and the other, time, was dilated $a \Delta t$, i. e. enlarged. It results in

$$c = \Delta l / \Delta t = \Delta l / a^2 \Delta t = f(1/a^2); \quad (25)$$

The same functions in opposite relativistic direction too, from the moved IF' to static IF, just we

have to divide both units contracting them by same factor and again the ratio of speed of light will stay constant.

The definition of speed constancy (24) could be the starting point of developing a relativistic theory as a must keep condition, then it wouldn't happen a currently discovered failure in SRT. This is even one of the two own postulates, which was unknowledgeable ignored.

Now anyone can see it easy. This easy testing view no one did discover so long time while tricky thinking about mystic “simultaneity and synchronized clocks” and light signals coming to late did made us busy. And millions “understood the SRT”. In this two lines all SRT is a transparent case of over interpretation and overzealousness. Thanks to Einstein and all who left it untouched for me to be discovered. I'm that happy founder of a pearl of this seldom important eye opener wonder. I never thought about SRT it could be wrong, no - it is not possible. I did “understood” it too. Many years I did it. We all “understood” it.

9. Results of comparing SRT and asymmetric level relativity

In Tab.1 the compare result of two theories is in compact form available.

	Asymmetric Level Relativity		SRT, mixed level		
	stationary IF	moved IF'	stationary IF	moved IF'	
time unit	$\Delta t' = \gamma \Delta t$	$\Delta t = \Delta t' / \gamma$	$\Delta t' = \gamma \Delta t$	$\Delta t = \Delta t' / \gamma$	consensus
time measured	$t' = t / \gamma$	$t = \gamma t'$	$t' = t / \gamma$	$t = \gamma t'$	consensus
length unit	$\Delta l' = \gamma \Delta l$	$\Delta l = \Delta l' / \gamma$	$\Delta l' = \Delta l / \gamma$	$\Delta l = \Delta l' / \gamma$	contradiction
length measured	$l' = l / \gamma$	$l = \gamma l'$	$l' = l / \gamma$	$l = l' / \gamma$	contradiction
2-d postulate speed of light c	$c' = \gamma \Delta l / \gamma \Delta t$	$c = (\Delta l' / \gamma) / (\Delta t' / \gamma)$	$c' = (\Delta l / \gamma) / (\gamma \Delta t) = \Delta l / \gamma^2 \Delta t$	$c = \gamma \Delta l' / \gamma \Delta t'$	contradiction in postulate

Tab. 1. Compare of SRT and present asymmetric level relativity in Lorentz transformations.

The Lorentz transformation of speed of light $c = c' \neq f(\gamma)$ is the fastest test of SRT which no one did.

SRT does not fulfil its own 2-d postulate and contradicts it irreparable.

$$c' = (\Delta l / \gamma) / (\gamma \Delta t) = \Delta l / \gamma^2 \Delta t. \tag{26}$$

This c is slowing down according to SRT by Lorentz factor squared $f(\gamma) = f(1/\gamma^2)$, i.e. it will be a variable and even can get to zero. It stays so if one takes not units but measured values too and in stationary IF only. In moving IF' the result for c is a right one. Reader is invited to have some ideas another then we have. This is a fact of a failure in SRT's basic conception as we discover here.

10. Minkowski diagram in view of length units and measured distances

The Minkowski mathematical space theory as an established quantitative description of SRT is also to be analysed for same failure if it was inherited.

But we discovered [6] even a prove for the current hypothesis of present paper. In short words the length units in Minkowski diagram are stretched as time units are too. They are going to be stretched with rising speed to infinity. And the measured distance will be shorter due to viewer units

fitting in the same distance between A and B. Complete success. Therefore it was all the time contradicting the SRT and it was stayed unrecognised. Minkowski himself didn't recognise it too and did support Einstein's relativity principle of a fully equality of all IF's. In one documents in standard books one can read about stretched length units, but on next page they are telling about contracting all lengths. Infinite long stretched before is then getting as a wonder shorted.

11. Decision on twin paradox for a preferred inertial frame with slower time

Such a decision is not offered by this new relativistic solution either, even if it was the motivation. Rather, "moving lengths become longer" can just as easily be added *ad hoc as a phenomena*, to accompany the old common thumb rule "moving clocks are slower", which more correct should be "moving time units are longer stretched" as "moving length units are longer stretched" too and therefore measurement get viewer counted units measuring contracted distances and time lines.

To be able to decide that we need further better idea and we invite the reader to have a look at our other research on relativistics where we solved that problem too and again in a very unexpected conceptual way.

12. Location authenticity

We postulated and used this that any particle being at a moment in a location in space and time is in same location for all inertial frames, there cannot be two or more locations at a time for one particle. This is true for all particles included photon and gravitons and is expressed in $A = A'$. The distances between this locations A and B are measured in different IF with different length and time units and are therefore different values. This interpretation is the only possible one. In SRT even it is also in use, just never told it explicitly. We can read in SRT literature that in Lorentz theory space was physically contracted but in Einsteins theory it would be instead just a "kinematic effect", so we can conclude it is not contracting. So in this point we can agree with SRT.

The question if an events information will be sooner or later is not of relativity alone. It is classically the same as news always did need time for transport. But all events which happen in one IF also happen in all others. We don't need to break it just to justify the bar-pole paradox which doesn't exist at all. As we do not need any parallel worlds and realities theories too.

We win with demystifying relativism.

13. Relation to relativistic speed addition

As far to analyse this in the derivation they where used measured distances and time segments, both used shorted measured values which is correct. No length units failure did distorted that process. Therefore it must fit in new theory too.

14. Relation to the paradoxes of SRT

Main goal was that the bar-pole paradox vanished as whole as it is about events and invariance. Other paradoxes like Ehrenfels disc paradox and a rope connecting two rockets paradox never

where such ones because this situations cannot be found in nature or it happens as is. The rope in that case will get relaxed and it doesn't matter at all, if the rope tear apart, then it breaks. That would change nothing in SRT or here in new interpretation too.

15. Relativistic Simultaneity

Being central basic fundament of SRT to avoid the “bar-pole paradox” it has no such importance any more in the present asymmetric relativity. It was the main reason of the failure of SRT interpretation as this succeed to convince. Nevertheless we want to support stronger the invariance of events and a summary event as result of two events must also stay an invariant event. It cannot be prevented in no one of inertial frames just by someone's moving. If it seems so we must change thinking and search for the failure reason.

16. Equality of inertial frames in SRT and the Relativistic Principle

It was too much over interpreted and was to insure that all physics law would be same in all IF. But having allowed time to be prior to that principle was inconsequential.

Now we can see that it is possible to have a relativistic level difference between IF's and nevertheless all physical laws in same form and same constants are measured in each of IF's because they would be measured with relativistically changed units.

So this was something absolute to declare them so extremely “equal” as far as to tell that every one is shorter then the other and this other is also shorter then oneself. This is now clear that it was absurd.

We have surely some how not fully equal IF's, if moved IF are preferred to have a time dilation and now in the length happens also the same level principle. There is a level relativity in nature, it is a fact and we will follow this path deeper.

The Relativistic Principle in SRT is the deeper reason for the discovered failure and we will refer more to that theme. We can now conclude that a new Relativistic Level Principle must exchange it.

17. Space in SRT and in new asymmetric level relativity

Space is stretched and contracted in SRT, even if told just cinematically, to serve the relativistic effects under keeping speed of light an invariant constant. This is a philosophical view as consequence of space as a continuum. A continuum included the length units and was to stretch and contract in same direction. There is no separation possible between space and on him stitched units. It is like an elastic surface on which we have marked up or units and then it is all together stretched or contracted. To think them in opposite direction stretched and contracted was not possible under this fundamental view. This is the deeper reason of Einsteins and all in those time holding on that not just an occasion. The result was that inconsistent using units and measuring method in length while using in time dilation another correct method. Einstein must first have decided that space and units are continuum in itself, so units have to be contracted in same direction with space. Then he repaired that with the time dilation alone, inventing the “relativity of the simultaneity” using tricky

“synchronized clocks” which was invention of both Poincare and Einstein. The consequence is that “Andromeda paradox” and possibility of different realities which contradicts the invariance of events. This building was build on a wrong philosophical fundament and now it is over.

Subsequently of that space philosophy Einstein stepped over to create the General Relativity Theory GRT and it is very presumably that the same failure is build in in the 5 equations of GRT. If the length units are there inherited contracted with space together instead of stretching, then it is same philosophically deep failure and the result can be similar awful.

Now using the stretched units in order to measure viewer units between space locations $A=A'$ and $B=B'$ we indeed are keeping that space unchanged, static, while we change units only and we've got the consistency in Lorentz transformations back. The deeper reason is, that those units are length and time relative units of the elementary particles. How they do it, we can not know for now and we just accept it by phenomena. This is another space and that interpretation we didn't invent by some philosophical reason but we looked at the facts in nature which we see in figure 3 here. The locations must stay the same for all IF's. Units now are able to get different length in compare to each other and their wave lengths are the elementary units both of length and time - and mass. If the Lorentz factor would be thought to be billions large then the length of an elementary particle would be able to cover very long cosmic distances in the universe. The length of a space shuttle too could be then “very long”.

This is necessary too by the reason that infinite number of particles all have their own IF's and they need to agree about the locations in space. They cannot squeeze the space physically for themselves each another egoistic version of the reality and change that with their very high frequencies. If one particle was at a moment in a location then it was in that same location $A=A'$ in all IF's also. The locations are the same in same space and do not travel. The travelling is the job of the particles only. The question about space expansion we also will recover detailed in another work, but it can be thought for now that the space between A and B expands as another phenomena.

18. Historical review of Dynamic Relativity

1. Lorentz and Poincare contracted whole matter against an as a fluid meant medium with a certain flow direction and that was wrong; but having changed to “unrecognisable medium” and constant speed of light.
2. Einstein contracted moving matter only in an empty space without that fluid, which he also contracted, but contracting the space itself together with the measurement units cinematically, which leads to the paradox shifting locations physically for each of inertial frames and eliminating the relativistic contraction at all. At the end SRT even makes speed of light none invariant ignoring one of two own postulates and not recognising it 115 years until today. Being all the time most loved and proven theory for the glory of the physics.
3. Now in new consistent interpretation of Lorentz transformations it has been achieved that the measurement units both are relativistically stretched, instead of time units to be stretched and length unit to be contracted, in order to measure viewer numerical values for distances and time line segments between spatial locations, which stay in space in same locations and the space itself is not contracted. Speed of light is now invariant conform with 2-d postulate and paradoxes are avoided. Elementary particles are entities of the relativistic measurement with own measurement units in

them, which interact relativistically with the space and are the source for all macroscopic units. The space is the reason of all and is therefore not empty – at last it contains the still unknown reason.

19. Conclusion

Both postulates of Einstein are covering the new interpretation, which is simpler as we do not need to discuss a complex matter of synchronized clocks and simultaneity to serve a paradox which is avoided now at all. This maybe was the primary misleading idea. Many people will now understand relativity well and probably the reason of all discussion of the past and present was now discovered too. The anticipates of relativity did probably feel intuitively that something was wrong, but no one discovered what in detail.

Especially testing by speed of light as the second postulate discovered an evident contradiction in SRT is its dead certificate.

Now time and length both are relativistically asymmetrical between the inertial frames, which makes the relativistic theories more consistent and symmetrical in that unifying principle and it leads to a Level Relativistics which needs an idea more. We can diagnose that there is an evidence about a relativistic level nature of relativity. They are “moving level IF's” with higher relativistically effects then the less moving IF in compare. This deeper reason to discover will be next mission. We encourage the reader to study our another works on relativity, where we found a solution for that deeper problem too, being now parallel in process of publication.

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