

Planck constant discovered being relativistic and SRT violets own postulate

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A discovered relativistic Photon-Atom-Energy paradox led to a solution, according to which the Planck constant is to be treated relativistic, whereby a new relativistic effect and a fourth relativistic attribute was discovered. Nevertheless it stays invariant in Lorentz transformations. The same result was derived in another way and motivation using same new method. A second problem was discovered by analysing Planck mass, length and time relativistically. This does lead to a discovery of 4 more paradoxes of Special Relativity, which were solved by same relativistic Planck Constant. Testing new method on speed of light we discovered that in SRT it is not kept invariant but depends on Lorentz factor, so it contradicts own 2-d postulate. This is a logical failure in SRT due to inconsistent using length units and measurements and is irreparable. To solve that was necessary to assume that length too as time has to be stretched or dilated in its length unit. Longer length units as longer time units allow to measure contracted distances and time lines due to viewer number of longer units fitting between two space locations. At the end all now 4 relativistic attributes length, time, mass and Planck constant are asymmetrically between the Inertial Frames and do build an unified Level Relativity. All dispute is very vividly and easy for understanding without high mathematics. If we decline the square relativistic Planck constant then all 5 discovered paradoxes would stay irreparable in Special Relativity.

Photon-Atom-Energy paradox

A relativistic fast moving mass particle is given an energy mass with Lorentz gamma γ growth $m' = m \gamma$. But an atom that has become more mass energy as a result emits according to Special Relativity Theory, SRT, a red weakened photon (1) of a lower energy.

The shell electrons have also become relativistic heavier in the atom and one can expect that too the quantum differences between the electron shells are just as relativistic heavier and consequently should emit blue Doppler shifted photons. If one increase the speed, it will even worse. A contradiction that waits for discovery and a solution.

Solution

The solution offers a hypothesis that the Planck constant h' , since nothing else is available, by a relativistic transformation must undergo this failure to get corrected. A common rescue solution will help. Some well known formulas we write as anyone can see the way how it works.

According to SRT, "moving clocks are slower", so all frequencies are redder, lower.

$$f' = f / \gamma; \quad f' < f; \quad (1)$$

A De Broglie frequency of matter particles is known [1, 4].

$$f = E / h; \text{ from } h \cdot f = E \quad (2)$$

→ Matter frequency grows linearly with relativistic energy, with Lorentz factor γ .

$$E' = E \gamma = mc^2 \gamma = hf \gamma; \quad E' > E; \quad (3)$$

$$m' = m \gamma; \quad m' > m; \quad (4)$$

We assume with h'

$$E' = h' f';$$

$$f' = f / \gamma = E' / h' = E \gamma / h' \quad (5)$$

$$h' = E' / f' = E \gamma \gamma / f = h \gamma^2;$$

$$h' = h \gamma^2; \quad (6)$$

Now the relativistic energy of a mass particle according to the Broglie with our assumption of h' .

$$E' = h' f' = h \gamma^2 f / \gamma = hf \gamma \quad (7)$$

and this functions even if f is red shifted, the energy will be relativistic growing. So it is explained how a heavier Atom emits a redder photon.

The Planck constant must be corrected square-relativistic "blue" and matter frequencies and wavelengths in same way how photons are made "redder". Corresponding vice versa for inverse transformation. De Broglie's matter frequency is going to get higher (2) with the speed contradicting the SRT time dilation too. Now we can explain it by relativistically higher Planck constant too.

Besides the time dilation is thus also the Planck constant h' relativistic asymmetrical between the compared inertial frames, IF's. The asymmetry comes from time dilation and is therefore no question. This must not contradict to SRT but be just an integrated new consequence discovered. But we have to conclude about the mass of mass particles too, which is in SRT a symmetric attribute as the length. According to de Broglie (2) Planck constant and energy are connected and as energy is an equivalent of mass, then mass is connected too. Then the rest mass m has to be also an asymmetric attribute and this contradicts to the SRT.

$$m' = m \gamma; \quad m = m' / \gamma; \quad (8)$$

Now both the relativistic increasing energy and the red shifted dilated frequency of the matter particle in relativistic effect are working correctly, without contradictions.

$$h \gamma^2 f / \gamma = E \gamma = E'; \quad (9)$$

$$h' = h \gamma^2; \quad h = h' / \gamma^2 \quad (10)$$

Physically now it happens a relativistic correct red shift of the frequency $f' = f / \gamma$ and at the same time a „blue shift” of the Planck constant $h' = h \gamma^2$ with a squared Lorentz gamma, which gives the

fixes of the discovered energy paradox. As a result, the energy with blue shift is linear and has a frequency according to time dilation by red shift both correct according to SRT.

Some one will recognise, that de Broglie wave length was always thought to increase with growing speed and that would contradict to SRT, which does expect all periodical processes to time dilate and get lower frequencies. But it can be explained as in low classical speeds the frequency can first grow and when being closer to speed of light it changes the direction and would decrease according to SRT. And only the relativistic Planck constant is repairing that.

Checking invariant constants for relativistic units as a test and discovering a “thick dog” in 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 aside according to the theory in question. If we would use the SRT with contracting meter unit m/γ and stretching time unit γsec as done with time dilation, then we would get erroneous result on units $[m/\gamma^2 sec]$ and a variable function of light $c(1/\gamma^2)$ would be none constant.

$$c'[m/\gamma^2 sec] = f(1/\gamma^2) \rightarrow c \neq c' \quad (11)$$

Same with units symbols as SRT don't differ units from measured distances

$$c' = (\Delta l / \gamma) / (\gamma \Delta t) = \Delta l / \gamma^2 \Delta t \quad (12)$$

This is a sensational found as this contradicts the 2-d postulate of SRT about constance, i.e. invariance of speed of light under Lorentz transformations! At this moment it is to name in the title of this paper. SRT contradicts the own 2-d postulate! This is a discovery of an epoch and marks the time in before and after.

But how to solve that?

The solution must have eliminating that Lorentz factors and this is only possible when both units, of time and length, would be contracted or stretched, but both together not in contra directions. And that means the length must be as time an asymmetrical attribute too between IF's. There must be a length dilation too.

$$c'[\gamma m/\gamma sec] = c[m/sec] ; \quad (13)$$

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

This is a sudden new argument never expected which contradicts the SRT directly and strongly irreparable. The length unit must be stretched, dilated, instead of contracting due to a deep failure in SRT. As consequence using longer length units the distance will be measured contracted because viewer stretched units will fit between same space locations. So it serves that distances are relativistically measured shorter, this stays same. The locations in space are same in all IF's.

The same will come out by just transforming speed of light $V = l/t$ to check if it stays invariant and to find out again astonishing violation of the 2-d postulate in SRT. The Lorentz transformation of speed of light $c = c' \neq f(\gamma)$ is the fastest test of the discovered failure in SRT.

We will investigate deeper about the length contraction in SRT and we will find a failure. For the time being we take this result as hypothetically true result and use further in our argumentation for relativistic Planck constant.

Length units $\Delta l'$ are then to be stretched and asymmetrical as time units transformed back.

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

This units transformations already are enough for further procedure but to test we will show how we get quantitatively a contracted distance with a stretched length unit.

Measured length l' , as measured time too, is contracted due to viewer stretched length units $\Delta l'$ which do fit between two space locations A and B during a relativistic trip. N and N' are scalar variables of the number of units fitting between AB or A'B' in a measuring process. They are used commonly as scalar variable values of a measured length l and l' with an unit in mind.

$$l \Delta l = N \Delta l; \quad l' \Delta l' = N' \Delta l'; \quad (15)$$

Now we make a logic conclusion that in space the locations $A = A'$ and $B = B'$ are same and they do not travel in space due to different travellers inertial frames. This is our assumption that space is not contracting for each of infinite number of IF's individually and shifting locations physically in space – as this might be was thought in SRT erroneously or unrecognised. That means that both lengths in (15) do have the same meaning of measured distance $AB = A'B'$ just measured with different units. As we can measure same distance in miles or km and can write them to be equal distances.

$$AB = N \Delta l = A'B' = N' \Delta l'; \quad (16)$$

of (16) with (14)
$$N' = l' = N \Delta l / \Delta l' = N / \gamma = l / \gamma. \quad (17)$$

This is the result as a contracted measured distance l' using stretched length units $\Delta l'$:

$$l' = l / \gamma; \quad l = \gamma l'. \quad (18)$$

The units we use usually so: $l'[\Delta l']$, $l[\Delta l]$.

Now and only so using stretched length units (14) with stretched time units we can get right result for the invariance of speed of light $c = c'$ by eliminating both Lorentz factors by stretching both units or contracting both measured distance and time line:

$$c' = \gamma \Delta l / \gamma \Delta t = \Delta l / \Delta t = c = (\Delta l' / \gamma) / (\Delta t' / \gamma). \quad (19)$$

The 2-d postulate is now fulfilled, c is invariant, where SRT failed due to a logically failure in the method of measuring length. As long as there is no other solution this is the only one which did it. It is not to mix units and measured distance – the one type or the other must be used. This mistake exactly did erroneously the author of SRT using stretched time units and a measured length distance instead of length unit.

And we changed to a stretched length unit from a contracted one in opposition to SRT. We do contradict SRT because we know now as a fact it is containing a logical failure. A very thick one.

Control by Planck time, length and mass constants

We want to make a proof using another way just to find out, how the relativistic units of mass m' , length l' and time t' are connected with Planck Constants. We think at two Inertial Frames, IFs, to be compared. The logic is that Planck length, time and mass [5] are invariant constants and so they must stay invariant even if this values are relativistically attributes to be changed.

1. Planck time have to dilate

$$t'_p = \sqrt{\frac{\hbar G}{c^5}} ; \quad (20)$$

$$\frac{c^5 (t'_p)^2}{G} = \hbar ; \quad (21)$$

In that formula (20) we see that the time t , if changed relativistically to t' , would have changed also at last one of the 3 constants inside: G , c or h . So which one we can give free for that? We decide it to be h , as we are proving it here and c speed of light is in no case free. And above in considering energy of red photons and atoms we see only Planck Constant h , no Gravitation Constant G . But we also then have to prove that Planck Constant will stay invariant and always in each IF be measured same known value.

$$\frac{c^5 (\gamma \cdot t_p)^2}{G} = \hbar \cdot \gamma^2 ; \quad (22)$$

And we get same result for h or $h/2\pi$, without them would be a really problem $\hbar' = \hbar \gamma^2$.

Both Planck Constants h and h' are only different between the IF's, because in (22) the squared Lorentz factors γ^2 are eliminating each other and so h stays invariant in Lorentz transformations and Planck time too.

2. Planck mass also get a relativistic transformation

$$m'_p = \sqrt{\frac{\hbar c}{G}} ; \quad (23)$$

$$\frac{G \cdot (\gamma \cdot m_p)^2}{c} = \hbar \cdot \gamma^2 ; \quad \hbar' = \hbar \gamma^2 \quad (24)$$

Again, only if we have the Lorentz factor squared being a hidden factor in a relativistic h' , we can eliminate the Lorentz factor γ^2 carried by the mass m into relativistic mass m' and get, that the value of h stays invariant, measured in a relativistic IF by its new relativistic units for mass and time. And again we get the right result only as a consequence of our hypothesis, that h is a 4-th relativistic attribute. In any IF's all constants are measured as same values, but only due to correct relativistic

transformed units. The units themselves are also not to recognise relativistic changes. And Planck Constant is also getting the rank of an unit.

3. *Planck length with relativistic transformation*

$$l_p' = \sqrt{\frac{\hbar G}{c^3}} ; \quad (25)$$

$$\frac{c^3(\gamma \cdot l_p)^2}{G} = \hbar \cdot \gamma^2 ; \quad \hbar' = \hbar \gamma^2 . \quad (26)$$

The same problem and solution, but only if we assume, that the Planck length is going to be relativistically stretched by $(\gamma l)^2$, not contracted. And we know, that due to time dilation the wave length of emitted photons is red stretched and frequency is getting smaller and we just did began this present work with that thema. We must postulate, that same is true for Planck length being also a consequence of time dilation. The Planck time and length are smallest values and therefore they are measurement units on elementary particle basis, which are stretched and therefore they measure distances and time segments as contracted and dilated, because viewer of stretched units can fit between the same two points in space.

So we rolled out the new result on Planck Constant in some important another applications and derived same results in another way and motivation and it worked similar. And by the way we discovered and solved a big problem, being in 4 paradoxes in SRT, which are irreparable.

We conclude therefore that there is a strong evidence of the true teaching of our hypothesis and theories. Also here discovered paradox problems with the Planck constants cannot be left without attention, as they would wait for a solution anyway.

Now we know that there are 4 relativistic attributes, time, length, mass and Planck Constant. And all 4 they have measurement units, which are stretched and are asymmetrically between the IF's.

We can add to the known rule of thumb “moved clocks are slower” in same manner “moved lengths are longer”, “moved masses are heavier” and “moved Planck Constants are larger”. It is a symmetrical system in all now 4 relativistic attributes to recognise. And Planck Constant is a squared relativistically attribute.

The hidden Lorentz factor in relativistic Planck constant is in same manner to understand as all rest masses also as invariant constants do have this hidden Lorentz factors, which can only be recognized from outside from another IF. So it is nothing unusual to accept so. Within own IF all the Lorentz factors are eliminating each other and stay invariant only thanks to that facts.

4. *5-th paradox on Gravitation constant G solved too*

If we ask same according to G, then without our new relativistic Planck constant again it will appear an irreparable paradox. We can take any of the above formulas (13) to express G

$$G = \frac{c \cdot \hbar'}{(\gamma \cdot m_p)^2} , \quad (27)$$

and we see, that without the same trick on \hbar' an additional paradox would appear under the SRT making G not invariant. Speed of light c and mass are relativistic attributes and must get Lorentz

factors aside.

Units of Planck constant in view of relativity

If we have a look at the units of the spin s which is the Planck constant h too they are same as a for classical angular momentum with $[N\ m\ s]$ or $[kg\ m\ s^{-1}]$. This is telling us that it is a composed unit having length, mass and time in it. All three of them are relativistically attributes, which have to be treated relativistically by Lorentz factor. If we use our hypothesis and results about the length units stretching we have to put for each a Lorentz factor if the Planck constant as attribute of a particle is going to be in a relativistic interchange.

Then we get that Planck constant is in both possible unit forms a function of a squared Lorentz factor γ^2 .

$$h = f(\gamma^2) = f[Js] = f[kg\ m^2\ s /s^2] = f[\gamma kg\ \gamma^2 m^2\ \gamma^{-1}\ s^{-1}] = f(\gamma^2) \quad (28)$$

This is a “shadow” of a hidden Lorentz factors γ in each of the relativistic units. So we have won again one argument more for our hypothesis and results using another way.

By the way, if one thinks that the length unit must be contracted according to SRT then the result would be $h' = f(1/\gamma^2)$ so in any way a squared Lorentz factor is unavoidable and h is a fourth relativistic attribute. At the price that the photon-atom-energy paradox would get even worse and all other Planck constants mass and time would it too.

Also we can conclude, that some deeper unknown kinematic must be inside of the particle using the three more elementary units of length, mass and time by hidden gammas.

And then we can conclude further more, that in all constants we can assume same tricky hidden Lorentz factors being present there. And now we trust in these model well.

Elementary particles as units sources

The particles wavelengths and frequencies both photons and mass particles are the elementary units for mass, length and time and they are the relativistic comparators in interactions between them. All macroscopic units are just multiplicands with some scalar factor, which can be a definition of any size and so they can get larger or smaller in compare between IF's together with the elementary particles. Planck constant is related with the energy and mass and is composed of length, time and mass units. So then the most reasonable naturally units would be those of elementary particles.

Results

The masses are heavier and length units as time units are longer in travellers IF then in the earths IF. Due to that Planck constant h is larger in travellers IF too even squared. In opposite relative direction they have to be calculated reciprocally. It contradicts to SRT which was discovered to have a deep logic failure in using length units and measurements of distances, which is irreparable and did lead to a violation of the own 2-d postulate.

In each IF everything is measured with the own relativistically changed units and the result ends up

in the same measured numbers of constants, but with the stretched or shorter units in compare to other IF's. We cannot recognise it being in the given IF. The relations are same and we called it invariance in Lorentz transformations.

For the first time a question was formulated about the relativistic effects on units in all physical constants and was found a method to discover a hidden kinematic of eliminating the Lorentz factors of units in invariant constants. With that method the failure of none invariance of speed of light and the squared relativistic Planck constant were discovered. This method will be useful in further investigations.

The result is, that we have to transform asymmetrical, as it is in SRT for time dilation exclusively, now all 4 relativistic attributes including the mass and to stretch all units. Using that stretched units a measurement of length and time deliver contracted distances and time lines. By the mass this is not the like because number of elementary particles is invariant and therefore after each was growing relativistically the sum was too.

This is a fundamental change in the relativity theories. By the way all proves of time dilation are conform with present new theory and both postulates cover new theory too.

The bar-pole paradox does not occur at all and all tricks with synchronised clocks and simultaneity are superfluous. Moved space shuttle gets longer not shorter and both observer agree about that.

In SRT time dilation is already a relativistic level as they are IF's with a higher relativistic time dilation with the thumb rule "moving clocks are slower". But length and mass in SRT are symmetric attributes, which we now must contradict.

Now we see that all 4 relativistic attributes are asymmetric between IF's like time dilation and they build together a Level Relativity. About its deeper levelling reason we will report in another work soon and will win additional arguments for presented hypothetical Level Relativity Theory.

The quantitative summary we have in (8), (10), (14) and (18) Lorentz transformation formulas in new interpretation contradicting SRT.

$$m' = m \gamma ; \quad m = m' / \gamma ;$$

$$h' = h \gamma^2 ; \quad h = h' / \gamma^2$$

$$\Delta l' = \gamma \Delta l ; \quad \Delta l = \Delta l' / \gamma ;$$

$$l' = l / \gamma ; \quad l = \gamma l' .$$

And time dilation of SRT but more clear of the difference about dilated units (29) and a measurement of a contracted time line (30) which in SRT never was written down, when we only know the dilation (29) and did not recognise that this is an enlargement of time not a shortening (30).

$$\Delta t' = \gamma \Delta t ; \quad \Delta t = \Delta t' / \gamma ; \tag{29}$$

$$t' = t / \gamma ; \quad t = \gamma t' . \tag{30}$$

By the way we propose to use instead of dilation a more clear word stretching or enlargement of units and contraction to replace with measuring viewer units and vice versa if calculating back

direction. And to use it for all units equally. Contraction lead to think the space would be contracted and all together included units with it. Dilation does become a new creation word for non English speaker and they don't know that its meaning was enlargement. They use it as it would be the shortening time in twins paradox for the younger one.

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