The analysis of space interactions by the special relativity theory

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Abstract: At first it is shown - with the help of the velocity conditional length changes in the special relativity theory - that (as is known) the conditions of the special relativity theory don't apply to velocity changes, in principle. From that then a *generalization* of the space-time values of the special relativity theory is derived. At next it is shown that it is sensible and necessary to apply these generalized space-time values only to restricted space *areas*. The space areas defined this way can be distinguished from their surroundings, through what they have the ability to move like objects, why they are called space objects. The space objects have the important ability to be able to superimpose/overlay each other, so to form/build superposition areas, at/through what new space objects are created. Because of these superpositions (and with the help of the definition of the rest place at length changes) the space objects can interact with each other in the most various ways. They even can e.g. interact collision like. Because of their numerous interaction possibilities the space objects finally form the structure of the matter. The basic constituents of the matter consist of accumulations of many (small) space objects in which these space object accumulations have the ability to emit permanently new (small) space objects. And about these space objects, which are emitted field like by the space object accumulations, it is essentially, because with these space objects the interactions of the matter take place. So it can be shown how the electric effect arises by the emitted space objects, and how the magnetic effect arises directly (means for one and the same observer) from the electric effect. It finally turns out that the gravitate effect also arises directly from the electric effect. At all this it is that the space objects emitted by the matter always produce the conditions of the special relativity theory, too, as far as this must have validity. Furthermore it is possible to look at and to explain numerous further physical phenomena with the help of the space objects.
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0. Introduction

If at velocity changes the conditions of the special relativity theory [1] have to be valid, then the length change connected with that cannot happen in an arbitrary way and course respectively. The same also applies to the desynchronization, which is demanded mandatorily by the special relativity theory. However, this relatively simple (and well known [2][3][4][5]) problem is the reason - as it will be shown in a descriptive way - that it is difficult to assume that the special relativity theory applies to arbitrary conditions/circumstances and size conditions. It usually seems to be rather more sensible that the special relativity theory is valid only for restricted space areas and only under special conditions. In this paper a draft will be worked out and put up for discussion, which can solve this problems in a simple and descriptive way. For this, at first the spatial conditions are regarded with respect to the special relativity theory. From this then the space objects result. Then the superpositions of space objects are depicted, from what the interactions and the creations of space objects results. By the analyses of the observation position it is discussed about a conservation of momentum for space objects. Finally, the structure of the matter is derived from the space objects, and it is shown how the special relativity theory has to be regarded with the help of the space objects. Furthermore, the concept is applied to the electromagnetism and to the gravity, and at the end, a small experiment is proposed.

1. Length changes in the special relativity theory

In the special relativity theory the length of an object depends in the motion direction on its speed. If the speed changes, then the length also changes. Now, how does this length change happen?
The relevant connections can be understood best if one imagines (three-dimensional) scaled measuring rods.
If the length of a measuring rod changes, then the single markings of the measuring rod must move relative to each other, that is they have to get velocities. These velocities exist only for the duration of the length change.
It can be shown easily now that there always is a place (in the three-dimensional case it is an area) to which this length change is related to, in the meaning that this place does not move, it therefore is the rest place.
Now, in which way do the markings of the measuring rod move to cause the length change?
It makes sense to distinguish two cases:
On the one hand, the single markings can get velocities after each other, starting at one of the ends. This means that every marking will move - as soon as it gets its velocity - relative to the next, still unmoved marking. So, the length change moves through the measuring rod. If all the velocities have (in the simplest case) the same value, then the homogeneity of the scaling remains unchanged. As soon as the second to the last marking also has moved correspondingly, the length change is completed, and the last marking is the rest place. Why should the last marking be the rest place of all, however?
In principle the rest place can be everywhere, and in principle nothing speaks against the fact that the rest place also can be outside the measuring rod. In that case then, the length change will keep on moving until the rest place is reached. This means that the length of the distance between the measuring rod and the rest place will change in the same way like the length of the measuring rod. And while the length change covers the distance between the measuring rod and the rest place the markings of the measuring rod will still keep on moving - until the length change has reached the rest place. This means that not only the length of the measuring rod changes, but that it has also moved as a whole, and this whole movement corresponds to the length change of the distance between the measuring rod and the rest place.
If now the rest place is in the infinite one, then the measuring rod will move further eternally, too.
At first it seems strange to put the rest place outside the measuring rod perhaps, but, however, one mustn't forget that this length change is *not* a material conditional, elastic deformation which of course is tied to the object. Here it is the length change of the spatial area, which the measuring rod forms, and the space as such isn't bound to the measuring rod (the object), continues so also outside. Consequently, the length change also can continue outside the measuring rod, according to the rest place.

The second case of the type of a length change is that that all the markings of the measuring rod get velocities simultaneously, but these velocities then are differently big, and they get bigger and bigger with a growing distance to the rest place. Of course, it is valid again also here that the rest place can be also outside the measuring rod.

In principle, nothing contradicts to mix the two types of the length change. In the second type, for example, the differently large velocities can last differently long. (Because of the simplicity, the first-mentioned type will be called unsimultaneous length change, and the second type simultaneous length change.)

So, it is clear that length changes are accompanied by velocities, and these velocities (caused by a length change) must be taken into account if - corresponding to the special relativity theory - the length of an object changes due to a speed change. Said differently: only such velocity changes can happen whose courses agree with the conditions of the special relativity theory.

So, if e.g. the speed of a measuring rod shall be reduced, what means that its markings must move away from each other, this can be achieved with the unsimultaneous length change by slowing down the markings after each other, starting at the end of the measuring rod (with respect to its motion direction). One can regard this process as a purely mechanical process, but one also can regard this velocity change as a length change of the spatial area of the measuring rod, with the rest place in the infinity. (If one liked to change the velocities of real objects, then some more must be taken into account, which will be shown later.)
One can achieve (with an a little consideration) the velocity change also with a simultaneous length change or a combination/mixture of a simultaneous and unsimultaneous length change (mechanically or spatially). In every case, however, one recognizes that velocity changes must have very complicated courses to be in accordance with the special relativity theory.
This leads inevitably to the question whether it is sensible to presuppose that every length change of any arbitrary object at any velocity change always corresponds to the special relativity theory independently of the cause and the circumstances of the velocity change.
To this, the following thought experiment: Two measuring rods relatively far away from each other do move evenly with the same speed in a line in the same direction. So they are in the same inertial system. Now both measuring rods are accelerated independent of each other in the same way and at the same time-point (of the resting observer). According to the special relativity theory both measuring rods must change their lengths. At next, one connects both measuring rods with each other by a third measuring rod tightly, and accelerates all three measuring rods in the same way. Here now the length of the whole compound must change. This means that the length change of the two first scales which have been accelerated independent of each other should have happened from the begin on in such a way that the space between them also has had a corresponding length change. It is clear that this is not possible because there isn't any length change method/process which can accomplish this. In addition, the independence of the two measuring rods (objects) wouldn't be ensured here any more. Such dependences could be valid only in special cases, if at all.

If clocks would be at the ends of the measuring rods, then one would notice that the same difficulties also arise for the desynchronization of the clocks, which is very important for the special relativity theory. [6][7][8][9] (For the definition of the desynchronization, see at the end of chapter 2.) Indeed, in the case of an unsimultaneous desynchronization the propagation *direction* of the desynchronization-*change* had to be exactly contrary directed to that one of the length-change.

This thought experiment points that the velocity dependences of the lengths of objects - as it is demanded for the special relativity theory - is possible only for very restricted cases. (This is even more valid if, in addition, the desynchronization must adapt also correspondingly.) In the end, one must always be able to refer to a rest place and to concrete objects and to an exact length change course. The example also has shown that there *must* be cases in which the total length change of an object can*not* be in accordance with the conditions of the special relativity theory - since it is a generally valid example. Said differently: the conditions of the special relativity theory cannot be generally valid. It has to be assumed rather better that the special relativity theory is only valid in concrete cases, such as at electromagnetic phenomena. How then the space-time conditions of the special relativity theory can be valid for a real, macroscopic object - such as a moving train - will be shown in chapter 12.

2. The space and the special relativity theory

In the context of the rest place of length changes it has been discussed that the length of the spatial area of the measuring rod changes. Of course, every material object covers/encloses a spatial area, actually this spatial area is defined by the matter. However, one could see at the length change that it is *not* possible to distinguish whether the length of the matter changes or whether the length of the space area included by it changes (and with it the matter).
Since such a distinction isn't possible, it has to be legitimate to assume that the space area does exist further also without the matter and that its length can change. A length change needs a motion, which means that the space area can move. Generalized this means that space areas can have velocities.

This statement cannot be proved, but it results conclusively and it can't be disproved, and that it really makes sense is exactly what will be shown in the following.
So, if one can assign a length change and a velocity to a space area, then this means that for this space area the conditions of the special relativity theory can be valid generally. Said differently: with increasing speed the space area becomes compressed. If the special relativity theory is valid for the space area, then the time must be taken into account also, and this means that with increasing speed the time passes more slowly inside the space area, and that the desynchronization increases. (The last would be observed if two clocks, remote from each other, were inside the space area.)
So we recognize that a moving space area can be distinguished from its surroundings by its space-time parameters, and only through this it makes sense at all to define such a space area.
So, space areas are *really existing* objects, which can be distinguished from their surroundings by their space-time parameters. So space areas do exist independently of material objects.
In the first chapter it was shown that the conditions of the special relativity theory can not be valid always in principle - due to the difficulties at the course of the length change and the synchronization by/at speed changes. It is now that space areas - as they were described here - are the most basic objects which can be defined at all. Therefore, it makes sense to assign basic, generally valid space-time parameters to these space areas (also under consideration of the mentioned difficulties in the special relativity theory). Said differently: the space-time parameters of the space areas are no longer supposed to be in accordance *only* with the conditions of the special relativity theory. At the space areas it must rather be all about to find out which space-time parameters the different space areas have under which circumstances, and how these parameters do change. Anyway, a speed dependence is now no longer mandatory for space areas.

For the language simplification the three space-time parameters of the special relativity theory will be labelled as Rs, Rt and Rst, at which: L´=Rs*L, were L is the moving length and L´ is the proper length, t´=Rt*t, were t´ is the time in the moving system and t is the time in the resting system (with t0´=t0=0), and Rst is the desynchronization of the clocks in the moving system as it is required by the special relativity theory, that is the time difference per length unit in the moving system.

For space areas Rs, Rt and Rst are no longer speed dependent - as we have found out. In addition, Rs, Rt and Rst must no longer mandatorily depend on each other.
It is now, that every space area can be characterized by its Rs, Rt and Rst values. These space areas, characterized in such a way, will be labelled from this time on as space objects.
The definition of a space object with independent Rs, Rt and Rst values represents the consistent7logical and necessary generalization of the special relativity theory. From this numerous of applications arise. The bases for that will be worked out in the following.

3. Superposition of space objects

If space areas - that are space objects - can move, and they can be distinguished from their surroundings, then they also can meet/encounter. At these meetings they won't collide like material objects but they will superimpose. This superposition represents an interaction between space objects.
It must be assumed that both space objects (which superimpose) have influence on the superposition area. This means that the Rs, Rt und Rst values of the superposition area do result form the Rs, Rt und Rst values of the space objects, which form it. This means that the space objects, which superimpose, adopt the Rs, Rt und Rst values of the superposition area in the area of the superposition. This infers that their lengths (so their Rs values) do change in the area of the superposition. So, the velocity of the superposition area arises mandatorily from the velocities of the space objects, which superimpose, and from the course of their length changes (that are their Rs changes) at the superposition.
So, the superposition area has different Rs, Rt and Rst values than the space objects which form it. Since the superposition area is also a space area, and since it is distinguishable by its own Rs, Rt and Rst values from the surroundings, it is as well a space object of its own.
Unfortunately, at the moment there can be made no concrete statements yet about how the Rs, Rt and Rst values of two (or more) space objects, which superimpose, must form the Rs, Rt and Rst values of the superposition area.

Nevertheless, it can be shown that space objects are able to interact in the most various ways with each other due to their ability to superimpose. Here, their interactions are just as basic/fundamental as their existence itself.

4. Interactions of space objects

At the interactions of space objects the changes of the Rs values have particular significance since motions relative to rest places are caused through them. Therefore, except by their Rs, Rt and Rst values and their velocity, space objects have to be characterized also by their size and form. This should not be underestimated because it can have influence on their effect at interactions.
In principle, space objects have to be understood in this way that everything, which is inside them, is co-moved at their length changes. This is also valid for matter, which is in the inside of space objects. (This is the inversion of the argument that space is only formed by matter.)
The question is now, how do the Rs, Rt and Rst values of space objects change?
Well, this happens only by superpositions with other space objects. To this, it is best to imagine (again) two measuring rods, which superimpose with each other. To see the spatial changes better they only superimpose partly (see Figure 1).

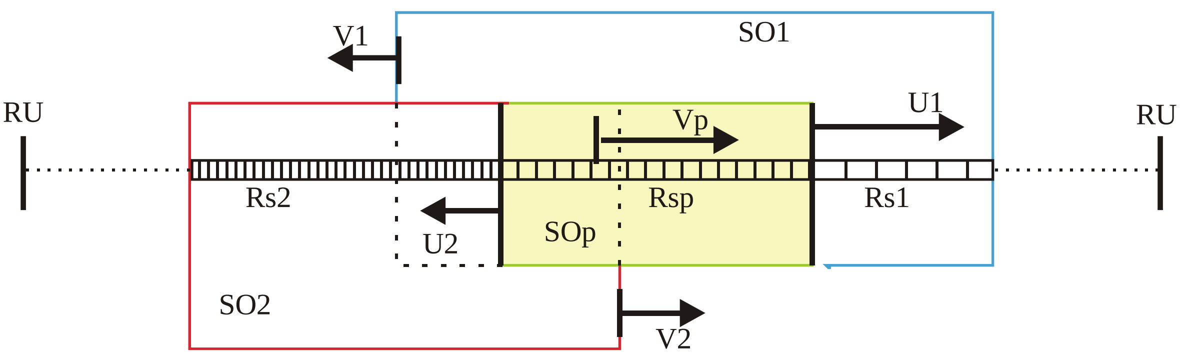

Figure 1. Superimposing of two space objects

The superposition of space areas corresponds to the unsimultaneous length change in chapter 1, at which the velocities of the single markings of the measuring rod change after each other. This means that to the initial velocities of the measuring rods ($\vec{V}_1$ and $\vec{V}_2$) the velocities of the length change must be added up. From this then the velocity of the superposition area results ($\vec{V}_p$). And from the velocity of the superposition area *and* from its Rs value (Rsp) (in which the Rs values (Rs_1 and Rs_2) of the measuring rods get changed in) then the velocities result, with which the superposition area extends ($\vec{U}_1$ and $\vec{U}_2$). Only if with these velocities the respective rest place is reached, the respective superposition is ended. For the measuring rod 1 (see Figure 1) results: $\frac{Rs_1}{Rs_p} = \frac{|\vec{U}_1 - \vec{V}_p|}{|\vec{U}_1 - \vec{V}_1|}$ Equation (1.a) and for measuring rod 2:

$\frac{Rs_2}{Rs_p} = \frac{|\vec{U}_2 - \vec{V}_p|}{|\vec{U}_2 - \vec{V}_2|}$ Equation (1. b).

From (1.a) and (1.b) one recognizes the already mentioned dependence of the velocities of the superposition area from its superposition Rs value (Rsp). (From the four unknowns, though, two will always have to be known, e.g. Rsp and $\vec{V}_p$ or $\vec{V}_1$ and $\vec{V}_2$.)
Equation (1) still will be used briefly in later chapters.

In Figure 1 the $\vec{U}_1$ and $\vec{U}_2$ are contrary directional. Of course, they also can be equal directional; they even can be equally big.

In addition, two rest places were indicated (RP). Here it is meant that way that the respective superposition moves toward the rest place, which can be also in the infinite.
If the superposition moves away from the rest place, then here the rest place also can never be reached. Nevertheless, as soon as the superposition is ended the velocity, which is caused by the length change, becomes zero - since the distance between the space object and the rest place has already changed its length.

Of course, the superposition area also can adopt the Rs value of one of the space objects which superimpose. This space object then doesn't change its length.

Taken exactly it is that SO1 and SO2 (see Figure 1) superimpose with each other only at the first touch moment, because as soon as the superposition area has come into being (with Rsp) then they superimpose respectively with the superposition area. At this it is that in this example the superpositions of SO1 and SO2 with the superposition area both yield the Rsp value of the superposition area again. If this weren't so, then the superposition area would be inhomogeneous, what in principle is also possible.
Here it must be emphasized once again that the Rs, Rt and Rst values and the velocities of space objects don't have to be in accordance with the conditions of the special relativity theory, as already pointed.

5. Emergence and types of space objects

New space objects come into being in principle only from superpositions of space objects. In Figure 1 it can be seen that the superposition area extends. If, now, one imagines a larger number of space objects then one can imagine easily that from them (or by them) more and more new space objects arise permanently. To this new emergence of space objects out of (from) space objects there are set no limits initially. Therefore, sooner or later the complete existing space must be filled with space objects. In a next step - in a sort of an evolutionary process - certain types of space objects with certain superposition characteristics will dominate and form so the known, ordered structure of the universe. *Now*, there can *not* arise any longer arbitrary space objects in an arbitrary way and in an arbitrary number (quantity).

As already said, space objects can be characterized by their Rs, Rt and Rst values, their velocity and their form and size. Here it does not matter whether the space objects have a homogeneous Rs, Rt and Rst distribution. A space object also can be sub-divisible into other, more space objects. If one then also takes into account that the Rs, Rt and Rst distribution can be different in all three space-directions, then many different types of space object arise - concerning their mutual interaction possibilities.

We recognize here now that most space objects superimpose permanently. From these superpositions new (superposition-) space objects result. The superimposed space objects for their part do exist further eternally, but they develop no more effect, though. - Because every superposition area must be understood as a space object of its own, which has its own superposition and interaction modes.

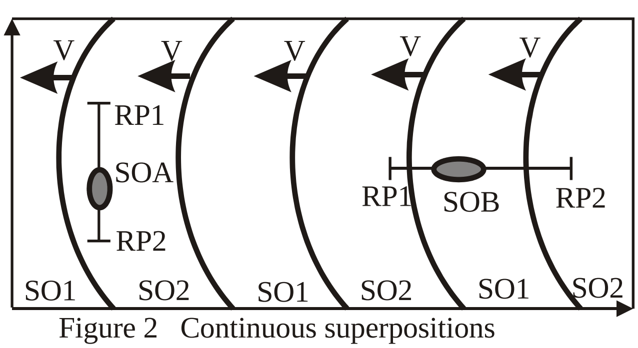

Figure 2 Continuous superpositions

To this the following example: In Figure 2 a (smal) space object (SOA or SOB) is superimposed continuously by two different space objects (SO1 and SO2) alternately. SO1 and SO2 move with the velocity $\vec{V}$.

So, first e.g. SOB superimposes out of SO2 with SO1 and then SOB superimposes out of SO1 with SO2. One could assume now that the effect of the superposition from SO1 in SO2 undoes the one of SO2 in SO1 again - that, so to say, the "leaving" of SOB out of SO1 undoes the "entering" in SO1. However, such a symmetry isn't given since the superposition of SOB with SO1 produces a superposition area and every superposition area is an independent space object of its own with its own superposition characteristics, and the superposition of this superposition area with SO2 can be basically different from the superposition of SOB with SO1. In the example of Figure 2, though, there isn't such a big difference; here it is only that SOB (or SOA) is alternately compressed and stretched by SO1 and SO2, in which the rest place is placed on respectively opposite sides of SOB (or SOA) (respectively RP1 and RP2). On this way SOA and SOB can gradually be moved by the space-waves SO1 and SO2 continuously without SOB and SOA being changed. If the rest places are respectively in the infinite, then the velocities, which are produced at SOA and SOB, never stop/end, and this means that they are added up, which represents an acceleration.

One can imagine in Figure 2 also very well a material object instead of SOA or SOB. Prerequisite for that would be that Rs, Rt and Rst values can be assigned to this material object (and correspondingly also rest places for superpositions). (SO1 and SO2 could be gravitational or electromagnetic waves, and SOA and SOB could be charges or masses. [10][11][12][13])

6. Reflections / oscillations of space objects

If one imagines a space object as a measuring rod again, which superimposes with an another space object, then the velocities of the markings of the measuring rod change in the superposition area in such a way that the superposition-Rs-value (Rsp) arises. Regarding this, the velocities of the markings can change their *direction* in principle. In addition, the velocities of the markings can be bigger than that one of the space object, which superimposes the measuring rod. Said differently: The measuring rod is reflected and turned over at the space object. (Taken exactly, the measuring rod superimposes with the superposition area which is moving away from the space object.)
For e.g. equation 1.a this means that ($\vec{U}_1$-$\vec{V}_p$) < 0 is so that Rsp < 0 is. (In which the measuring rod would be SO1.)
Reflections mean naturally the ability to oscillate.

7. Rotations / Deformations at space objects

Of course, space objects also can rotate. This has to be understood that way that an observer who is co-rotating with a rotating space object (inside it) cannot detect this rotation absolutely. He will detect no centrifugal forces and light beams will propagate straightway. Only by watching the not rotating surroundings he will be able to detect his rotation. This *must* be so because the space inside of any space object still has to be regarded as absolute.
The rotations of space objects could be described as relativized rotations since they aren't ascertainable absolutely but only relative to other observers - just similar to steady straight motions.

If there could be assigned at least small Rs, Rt and Rst values also to (large) macroscopic, material objects, then these objects should also be at least *partly* able to carry out relativized rotations, which must be taken into account at the calculations.[14] Some analogous applies to a relativized translation. The Sagnac-Effect could have to do with that. [15][16] (see also chapter 11 and 12)

It can make sense to assign tangential Rs, Rt and Rst values to rotating objects. Particularly for the Rs value interesting coherences can result here, which show that under appropriated conditions a light beam can be observed as straight even by observers, which are rotating against each other.

The deformation has to be understood that way that objects, which are inside of space objects, which are being deformed, also deform.

8. Observation Position

Especially for space objects the observation position is particularly important since their Rs, Rt and Rst values don't have to be in accordance with the conditions of the special relativity theory.
Here, the direction dependence of Rst has to be taken into account (it is therefore $\vec{R}st$).
For the transformations between the inertial systems Q and Q´ (Q´moves with $\vec{V}$) results:
$Rs' = \frac{Rt - \vec{R}st * \vec{V}}{Rs * Rt}$ (2.1), $Rt' = \frac{1}{Rt - \vec{V} * \vec{R}st}$ (2.2) and $\vec{R}st' = \frac{-\vec{R}st}{Rt * Rs}$ (2.3).
It has to be taken into account that Rs<0 can be. A Rs<0 means the direction inversion of lengths in dependence of the observation position.

If relative to Q and Q´ the space object m moves with the velocity $\vec{v}_m$, it is:
$\vec{v}'_{mx} = \frac{(\vec{v}_{mx} - \vec{V}) * Rs}{Rt + \vec{R}st * (\vec{v}_{mx} - \vec{V})}$ (2.4), $\vec{v}'_{my} = \frac{\vec{v}_{my}}{Rt + \vec{R}st * (\vec{v}_{mx} - \vec{V})}$ (2.5), $\vec{v}'_{mz} = \frac{\vec{v}_{mz}}{Rt + \vec{R}st * (\vec{v}_{mx} - \vec{V})}$ (2.6) and
$\vec{v}'_m = \vec{v}'_{mx} + \vec{v}'_{my} + \vec{v}'_{mz}$ (2.7).
For the conditions of the special relativity theory with $v_m = v'_m$ =c (c = Light speed) and V=-V´ results of course: $Rs = \frac{1}{\sqrt{1 - \frac{V^2}{v_m{}^2}}}$, $Rt = \sqrt{1 - \frac{V^2}{v_m{}^2}}$ and $Rst = \frac{-V}{v_m{}^2 * \sqrt{1 - \frac{V^2}{v_m{}^2}}}$.

Furthermore results: $Rt'_m = \frac{Rt_m}{Rt + \vec{R}st * (\vec{v}_{mx} - \vec{V})}$ (2.8), $Rs'_m = \frac{Rs_m * (Rt + \vec{R}st * (\vec{v}_{mx} - \vec{V}))}{Rs * Rt}$ (2.9) and
$Rst'_m = \frac{-Rst_m}{Rs * Rt}$ (1.10).

If the conditions of the special relativity theory aren't valid, then interesting coherences can arise, particularly in the context of transformations.
So e.g. it is possible that - caused by the desynchronization (Rst) - the $\vec{v}_m$ of m has exactly such a value, that from the view of Q´ no time passes for m, that therefore vm is infinitely big from the view of Q´.
Actually the desynchronization of Q´ can even have such a value that the objects of an explosion, which is spherical from the view of Q, can be going backwards in the time of Q´. These objects then appear suddenly in Q´, as if they come out of nothingness, and they appear always double (in pairs). The proper times of these out of nowhere coming pair objects are respectively contrary directed (forwards and backwards). If, on this occasion, the space area of Q´ represents the laboratory conditions, then this would be an explanation for the pair creating of matter.[17][18]
The possibility of a long-distance effect also arises here at least theoretically (but it will not be discussed).
Furthermore, the philosophical thought arises - under consideration of the possibility of the sudden appearance of space objects and negative time courses in dependence of the observation location - that the universe can have created itself by itself, that so it has created itself out of its existence.

9. Superposition criteria by changes of the observation position

Now it will be shown that no arithmetical contradictions result in the context of transformations.

Equation 1.a is (also see Figure 1): $\frac{Rs_1}{Rs_p} = \frac{\left|\vec{U}_1 - \vec{V}_p\right|}{\left|\vec{U}_1 - \vec{V}_1\right|}$ The question is now whether the same coherence results also for Q´. It appears that if the corresponding values from the equations (2.i) are put into $\frac{Rs'_1}{Rs'_p} = \frac{\left|\vec{U}'_1 - \vec{V}'_p\right|}{\left|\vec{U}'_1 - \vec{V}'_1\right|}$, then concurrence results!

Now some general criteria for superpositions will be deduced from the transformations of the observation position.

The following case: Two space objects move relative to Q with different velocities, and both have from the view of Q the same Rs, Rt and Rst values. The reference-system/space-object Q´ has the values Rs≠1, Rt≠1 and Rst≠0 from the view of Q. This means that from the point of view of Q´ the two space objects will have respectively different Rs, Rt and Rst values from each other. This can be seen easily at the transformation equations, since the space objects have different velocities.

So, if the two space objects superimpose from the view of Q´, then of course the superposition area will (generally) have new Rs, Rt and Rst values. In addition, these new Rs, Rt and Rst values will generally be new values also from the view of Q (corresponding to the transformation equations), which means that they will be different from the initial values. Said differently: even if two space objects superimpose, which have the same Rs, Rt and Rst values, the superposition area will generally have nevertheless different (new) Rs, Rt and Rst values.

Another aspect is the following: If the velocity of a space object changes from the view of Q without changing its Rs, Rt and Rst values, then from the view of Q´ (which is distinguished from Q by its Rs, Rt and Rst values) together with the velocity there *will also* change the Rs, Rt and Rst values of the space object. Said differently: Only by the change of the observation position additional changes of the Rs, Rt and Rst values take place. This aspect has meaning for the next chapter.

10. Conservation of momentum at space objects

The conservation of momentum for space objects will be an aid (tool) for the calculations of their interactions. It results from the fact that space objects are able to interact in the most various ways. They can even reflect themselves mutually.

So, before of the (collision like) interaction the space objects, which are relevant for the conservation of momentum, are these space objects which are going to superimpose. After the collision the space objects, which are relevant for the conservation of momentum, are the superposition areas which will result from the superposition. Of course, the number of the space objects before the interaction doesn't have to correspond to the number of the space objects after the interaction. In addition, a superposition can be never regarded as completed since every superposition changes into further superpositions so that a conservation of momentum for space objects is only valid for particular superposition phases.

At next, a quantity corresponding to the mass must be assigned to the space objects for the momentum. This quantity corresponding to the mass could be connected with the Rs, Rt and Rst value distribution, with the size and form and with the velocity of a space object. Especially the position of the rest place at superpositions will also have meaning for this. It nevertheless is only a purely formal assignment.

A conservation of momentum for space objects could look like the following: Let an interaction take place in the system Q between two space objects to which the conservation of momentum will apply. In addition, the Rs, Rt and Rst values of the space objects will not change at this interaction. From the view of Q´ (which moves with the velocity V and which has Rs≠1, Rt≠1 and Rst≠0), *no* conservation of momentum will apply generally to this interaction, *and* in addition, the Rs, Rt and Rst values of the space objects will *change* by the interaction. The masses of the space objects will remain in this case as constant. So we recognize: the additional momentum, which Q´ measures, is accompanied by changes of the Rs, Rt and Rst values which don't take place in Q.

From this the following assumption is deduced for a conservation of momentum rule for space objects:

Every (collision like) interaction between objects, to which Rs, Rt and Rst values can be assigned, is based on a conservation of momentum which is superimposed by velocities which are caused by changes of the Rs, Rt and Rst values.
The same will apply to the conservation of energy.
So one could say, formulated descriptive and briefly: At a collision, momentum and energy can be created from space and time newly, and momentum and energy can dissolve into space and time.
It would be interesting to known now how big the momentum and energy share from space and time is at such an interaction. Unfortunately, there isn't any answer to this yet, but the following example provides a clue: In Q an interaction takes place with conservation of momentum, and the interacting space objects have before *and* after the interaction Rs=1, Rt=1 and Rst=0. In Q´ the conservation of momentum is *not* valid for this interaction, and the space objects have Rs≠1, Rt≠1 and Rst≠0. But, if, now, these Rs, Rt and Rst values of the space objects in Q´ are changed in Rs=1, Rt=1 and Rst=0 at both before and after the collision, then the conservation of momentum is valid in Q´, too. The a little long calculations to this are left out here since some parameters always remain free to select so that the momentum share from space and time cannot be calculated. However, it seems as if momentum and energy from space and time does superimpose the momentum and energy conservation of an interaction.
If Rs, Rt and Rst values could also be assigned to (macroscopic) material objects, then momentum and energy shares from space and time had to be taken into account also for this material objects, too.
In addition, of course, the acceleration has to be considered. [19]

11. Matter

It was already derived that the complete space is filled with space objects, which permanently move and change, and which create on this way the order of our world. The next, logical and consistent generalization step would be to say that also the matter itself consists only of structured accumulations of space objects. Particularly the oscillations and rotations of the space objects can very well cause space object accumulations which are stable and closed into itself. These space object accumulations then, must have a dynamic inner equilibrium at which the space objects are permanently changing. Because of this *dynamic* inner equilibrium, there also can be created permanently new space objects, which then will be emitted by the space object accumulation. Despite these permanent new emergence and emission of space objects, the space object accumulation can remain stable since new superposition areas can be formed in an arbitrary number, as already mentioned. These permanently emitted space objects then do correspond to a field, like the gravitational or the electrical field, since these fields also flow - so to speak - away of the charges or the masses.[20]
These space objects emitted by the space object accumulations can now meet/encounter other space object accumulations and penetrate into these. Since they come from outside, they can disturb the inner equilibrium of these space object accumulations and thereby a space object accumulation can - e.g. - be forced to move as a whole (see also Chapter 14).

So, the idea, which is here behind this, is, that matter can interact with each other through the interchange of space objects.
If the space objects are emitted in all directions symmetrically by the space object accumulations, then the $1/r^2$ distance dependence results automatically, too.

A quite funny derivation from this is this one that if the density of the emitted space objects is a measure for the intensity of an interaction, then it can be imagined that here a saturation density can be reached, above which no increase is possible. This would mean for the gravitation e.g. that there can be a maximum, not exceedable gravitation strength.

An even much stronger distance dependence than the one with $1/r^2$ results if the number of the emitted space objects depends on the number of the absorbed space objects. Here, an exponential increase of the interaction will result, which is in dependence of the distance. Since the interaction increases unstoppably, this finally can lead to the destruction/dissolving of the interaction partners. Such processes are known from nuclear forces.

Here, perhaps, something must be said about the size of space objects: In principle, space objects can have any arbitrary size of course. Which size, however, they actually have in the reality of our nature can not be cleared here. It must be assumed, indeed, that they are very small if they form atom structures. On the other hand they also can be inhomogeneous and they can be sub-structured by smaller space objects what means that they also can contain very big structures. Finally, this is a question of definition and depends on the interactions which take place.
Here, a remark is sensible: It is at least in principle possible that space objects superimpose with other space objects without having any effect. So, they can move through areas, which contain many other space objects, (so to speak without being stopped) until they meet space objects with which they *do* have an effect. This is valid independently of the size conditions in principle. By this means, the bandwidth of the interaction possibilities of space objects is enlarged at least theoretically. So it can be, e.g., that different space objects can be relevant for also different physical phenomena.

12. Electromagnetic phenomena / constancy of light speed

It was already explained that space objects are not in accordance with the conditions of the special relativity theory in principle. On the other hand, it seems to be that in our world especially the electromagnetic phenomena do correspond exactly to these conditions. This, though, isn't a contradiction. As it has been shown, our complete world is filled with space objects. They form the structures of the matter, and they fill the space between the matter - last but not least by the emissions of the interactions of the matter. Meanwhile, for the space-time conditions (this are the Rs, Rt and Rst values) of our real, macroscopic world only what the totality of all space objects (of an area) results in the sum is of importance macroscopically, and not an individual space object. And obviously the totality of the space objects of our world results on average exactly the conditions of the special relativity theory, particularly for electromagnetic phenomena.
This can be depicted very concrete: Electric charges (which will be understood also as space object accumulations) emit the space objects, with which they interact, symmetrically in all directions. These space objects have Rs, Rt and Rst values which correspond to their type. Now, if the charge moves with a velocity V, then the space objects, which the charge emits, will get additional Rs, Rt and Rst values in motion direction. These additional Rs, Rt and Rst values are exactly in accordance with the conditions of the special relativity theory, and that in dependence of the velocity of the electric charge. Said briefly: space objects, which are emitted by electric charges, have Rs, Rt and Rst values in the motion direction of the *charges*, and these values dependent on the velocities of the *charges*, according to the special relativity theory. This is just as if the electric charge is producing continuously a spreading space area around itself whose Rs, Rt and Rst values are exactly in accordance with the conditions of the special relativity theory. It is now, that these relativity-space-objects move for a resting observer with light speed. Furthermore, they move also for the emitting charge with light speed since around it the conditions of the special relativity theory are valid. So the constancy of the light speed is given.
A very descriptive example to this is an moving train. All the electric charges of the atoms of the train emit space objects whose Rs, Rt and Rst values in motion direction (of the train) are in accordance with the special relativity theory so that the conditions of the special relativity theory apply to the complete train. Said differently: For an observer resting relative to the ground the train will be compressed in motion direction. This length change takes place by the fact that the space objects, which are emitted by the electric charges, superimpose the space between the charges, so that the space between the charges also gets the corresponding Rs value. Said differently: if the train changes its velocity, if so the electric charges of the train change their velocities, they always emit relativity-space-objects of which the Rs, Rt and Rst values always correspond to the respective velocity - with respect to the conditions of the special relativity theory. These then superimpose the space between the electric charges, and produce there the conditions of the special relativity theory. If all the electric charges of the train have changed their velocities, then the train as a whole also has the conditions of the special relativity theory. For this it does not matter in which order the electric charges change their velocities. It also can be seen clearly here that the length change of the train mandatorily needs time. The same process also applies to the Rt and Rst values. Here it can be

very well recognized that Rs, Rt and Rst values can be assigned also to material objects. It has to be taken into account that the *length* of the space objects, which are emitted from the charges, also depends on their Rs values (also they are all the shorter the faster the charges are).
If now an electromagnetic wave comes from outside and crosses through the train, then it will have light speed for both for an observer inside the train and for an observer resting outside. Since this is valid for all material objects, which consist of electric charges, the light speed also is constant for all observers. Only *while* the velocity is changing this isn't absolutely valid. The analogous also applies to satellites, such as the GPS. [21]

It can now be remarked legitimately that light-speed-space-objects, which are emitted by other charges and which move with appropriately other velocities (e.g. a second train, which overtakes the first one), also can superimpose the area of the first train. This actually happens and such light-speed-space-objects, coming from outside, can disturb the inner conditions - which correspond to the special relativity theory - and must be taken into account. Such a case is, e.g., if material objects move radially to the earth so that they move in the same direction as the mass of space objects, which come from the earth. In this sense, the gravitation is nothing else but the perturbation of the inner special-relativity-theory-conditions of material objects. In this context, it has to be taken into account, though, that the superposition areas of the light-speed-space-objects highly probably also have light speed, which indicates, that light-speed-space-objects can extinguish each other mutually (at least if they meet/encounter frontally), and this means that the number of the light-speed-space-objects, which come from electrically neutral objects, is relatively small. It can be recognized here that the constancy of the light speed is in principle a local phenomenon. That this local constancy of the light speed *must* be valid can be recognized now by this that this constant speed is substantial for the interaction of the matter (so, e.g. between charges). If this interaction speed would not be constant, but if it would refer to a medium, then at every speed change relatively to the medium the interaction conditions would be (dis-)adjusted, and this would hardly contribute to the emergence/formation of stable conditions. Especially in this cognition the special relativity theory shows its great performance.

A further, legitimately remark is this that the electric charges in atoms and atom-compounds do move very much and very fast, and they therefore produce the correspondingly conditions of the special relativity theory at their surroundings. Here it has to be remarked that the conditions of the special relativity theory, which are produced by a material object, are resulting values. Only if a more complexly built up object moves as a whole, it will produce values in its surroundings which differ from Rs=Rt=1 and Rst=0. Nevertheless, the motions of the electric charges in the matter are of course of great importance since especially the electrons execute motions which correspond to oscillations. Because of this the light-speed-space-objects, which are emitted from these oscillating charges, are alternately stretched and compressed. From that, a similar interaction can result in the atom-compound as it was described in chapter 5 (Figure 2), in which particularly the rest place had to be taken into account.
At the end of this chapter it still must be said that unfortunately no details about concrete superposition conditions/courses of the light-speed-space-objects, which are emitted by charges, can be given here yet. On the other hand indeed, here only the general concept is developed. However, the problems are thoroughly soluble. To this still the following:

A bundled electromagnetic wave (like e.g. γ-rays) could be created by the fact - and for the moment this is only an assumption in this place - that the space objects, which are emitted from the electric charges, meet/encounter *in angle* and superimpose. By this, the effects of one space-direction do cancel each other out mutually, while in the rectangular direction some effects do remain. In addition, by this there can arise spatially limited oscillations, which are vertically to the propagation direction. Unfortunately, nothing more precise can be said here yet.

The gravitation could be - again only an assumption - a purely macroscopic interaction, which only applies to objects which consist of many electric charges. On the other hand, for the interactions of the charges with each other perhaps the gravitation doesn't have any significance, perhaps it isn't even existing for the charges.

Furthermore, it was explained in chapter 1 that in the special relativity theory a superposition must start from behind (according to the motion direction) to change the Rs value while the change of the Rst value must start from the front. So, in principle there are two superpositions necessary to get the conditions of the special relativity theory at velocity changes of space objects. This could mean that two types of light-speed-space-objects are emitted by the electric charges correspondingly. This could lead to still unsolved phenomena.

13. The electric and the magnetic interaction

13.1 The electric interaction

In this chapter it will be shown how the electric interaction can be explained clear and perspicuous and very easy with the help of the space objects. Then it will be shown how the magnetic interaction can be derived directly (so, for one and the same observer) from the electric interaction.

It was already said that the electric elementary charge units (electrons and protons) consist of space object condensations. These space object condensations are held together (among others) by the numerous oscillations of the space objects they consist of. These oscillations then, produce the numerous of space objects, which are emitted by the charges, and with which they interact with other charges (these space objects move with light speed, and have their own Rs, Rt and Rst values, see chapter 12).

It is now that electric charges of the same sign repel each other, and these with different signs attract each other. This leads to the conclusion that there aren't only two types of charges, but that there also must be two different types for the mediator of the interaction (the space objects, with which the charges interact). Said differently: The space objects which are emitted by the positive charges (for the purpose of the interaction) are different from the ones which are emitted by the negative charges.

The two types of mediator-space-objects can be different in their Rs, Rt and Rst values and in their form and size. However, the most important and mandatory difference is the frequency with which the mediator-space-objects are emitted by the charges. It can be assumed that this frequency is constant to some degree for resting charges. This frequency results from the oscillation conditions inside a charges-space-object-condensation. Already the great difference in the quantity of the electrons and protons (which can be seen e.g. by their mass) indicates that the period durations of the oscillations inside them will be strongly different.

But, which meaning has the frequency? At first, it is so that a resting charge emits its mediator-space-objects symmetrically in all directions. Now, the emission of every space object causes a recoil, that is a small velocity change (just like the absorption of a space object also causes a velocity change). As long as the charge emits its space objects symmetrically in all directions, it doesn't move. But if it happens that the emission increases or decreases in one direction, then the velocity does change correspondingly. (Here, it may be repeated that the continuous absorption or emission of space objects causes also continuous velocity changes, which corresponds to acceleration.)

If, now, the frequency of the absorbed space objects matches the frequency of the oscillations with which the mediator-space-objects are produced, then that yields resonance, and that means that the oscillation is strengthened. As stronger and stable the oscillation is, as stronger the emission is, too, all the stronger the recoil is at the place at which the space objects were absorbed (see Figure 3a). This corresponds to a recoil. Since now the frequency of the mediator-space-objects, which are emitted from charges, corresponds (about) with the frequency of the oscillations (inner the charge), which produces these space objects, this therefore means that charges of the same sing repel (push off) each other.

If, now, the frequency of the mediator-space-objects doesn't match that one of the oscillation, then the oscillation can be destabilized through this. This has the consequence that the emission (that is the recoil) decreases in this direction, which corresponds to an attraction. So, if positive and negative charges have clearly different frequencies, then therefore charges of different sings will attract each other.

Taken exactly it must be even so that the frequency of the one charge type roughly abolishes that one of the other type. This arises from the magnetism described in the following chapter.

It is astonishing to recognized how the conditions at electrical charges simply arise from the frequencies only. Perhaps this frequencies are in connection with the spin. [22] However it is, in any case it seems to be a resonance phenomenon. The same (astonishing simple phenomenon) applies also to the magnetism.

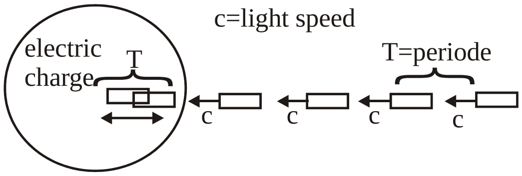

Figure 3a. Space objects superimpose electric charge

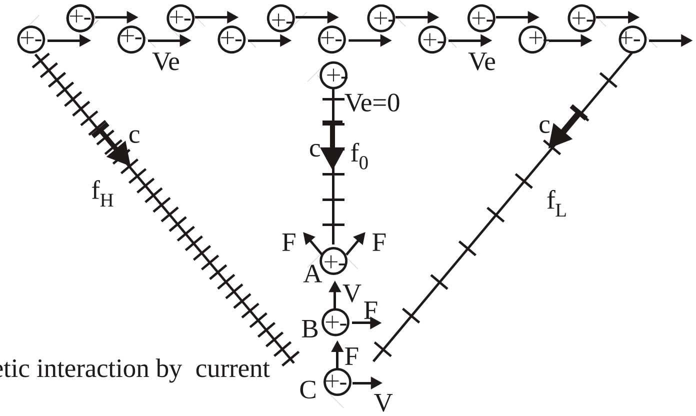

Figure 3b. Magnetic interaction by current

13.2 The magnetic interaction

In this chapter it will be shown that the magnetic effect can be explained *directly* (so, without having to change the observation position) from the electric effect.

If an electric charge moves, then the frequencies of the mediator-space-objects are shifted approximately in the same way as electromagnetic waves, which are emitted from moving emitters. This means that the frequency increases forwards approximately in the same way as it decreases backwards. For this we look at an electric current and a test charge (see Figure 3b). [23] The decisive criterion for the magnetic effect of the current on the test charge is the deviation of the frequency (of the mediator-space-objects) by the velocity (Ve) of the current (f_L and f_H) in comparison with a resting charge (f_0). The bigger the frequency deviation is, the more strongly the electric effect (force F) strength also will differ from the ideal resonance or counter-resonance effect strength.

If the velocity (V) of the test charge is zero (in Figure 3b this is A), then f_L and f_H differ symmetrically from f_0. This means that both in the direction of f_L and in the direction of f_H the force increases the same. This still isn't a magnetic effect.

If the velocity of the test charge is vertical to the velocity of the current (in Figure 3b this is B), then the frequency f_L (with which the test charge absorbs the space objects) will increase, which means that f_L is nearer to f_0 again, and that means that the force increases in this direction. The frequency f_H will also increase, but this time that means that the value of f_H differs more strongly from f_0, and that means that the force decreases in this direction. Resulting a velocity dependent force effect results, which is vertical to the velocity of the test charge.

If the velocity of the test charge is parallel to the velocity of the current (in Figure 3b this is C), then f_L increases, and therefore the force in f_L -direction increases, too. On the other hand, f_H decreases, which means that f_H differs even more strongly from f_0, and therefore the force decreases in this direction. Resulting a velocity dependent force results again, which is vertical to the velocity of the test charge.

It can be recognized here very well, how the conditions of the magnetic effect do yield exactly only by the changes of the frequencies, and that from the view of one and the same observer. Here, of course, the conditions of the special relativity theory have to be taken into account.

This example also was worked out to show that the concept of the space objects proves itself. It will be component of a further work to apply the concept of the space objects to the gravitation.

14. Inner development of space object condensations

This last chapter will deal briefly with space object condensations, which are the basic structures of the matter.

Space object condensations may consist of many space objects. If the velocity of a space object condensation shall change, all these space objects must change their velocities. This can have influence on the inner structure of the space object condensation. So, there is a connection between the inner structure of a space object condensation and its velocity. Therefore, this inner structure perhaps can also describe independent, inner developments, which finally can lead to spontaneous velocity changes of the space object condensation. Such an inner development doesn't have to proceed linearly from the point of view of time, and it even can lead to the dissolving of the space object condensations. In addition, inner developments also could be provoked from outside. An example to this could be the mass spectrographs, which cause *temporary* spontaneous velocity changes by their electric and magnetic fields at the atomic nucleuses. From this then there can result deviations in the trajectory courses, which in this case are wrongly interpreted as mass deviations.

In addition, the spontaneous velocity change of a material object also means a spontaneous momentum and energy change. The momentum, indeed, could remain constant if the velocity change is accompanied by a corresponding mass change, but, however, the energy would change nevertheless. In anyway, for a spontaneous and inside developed velocity change the classical momentum and energy conservation isn’t valid any more. Instead, the momenta and energies, which arise from space and time or which change themselves into space and time, must be taken into account (see chapter 10). To this and finally the following small experiment (experiment rocket):

A hollow body, which is completely closed and uninfluenced from the outside, is subdivided into two inner areas. In the one area (room A) is e.g. a gas of (heavy) atoms or molecules or some other for fast particles part-permeable substance, and in the other area (room B) is a source of fast particles, e.g. some very hot gas or rays as α-, β-, or γ-rays. These fast particles, now, do collide with the atoms in room A, but they are not able to leave the hollow body (see Figure 4). There is now the hope that the collisions and the many reflections by the rays from room B can cause an imbalance in the momentum and energy transformations so that momentum and energy is generated from space and time in only one direction on average. This means that the velocity of the hollow body will change without the hollow body emitting particles, which is without recoil and without an influence from outside. It should be examined experimentally which fast particles (rays) must collide at which angles with which atoms or atom combines (e.g. molecules) so that resulting momentum and energy occurs from space and time.

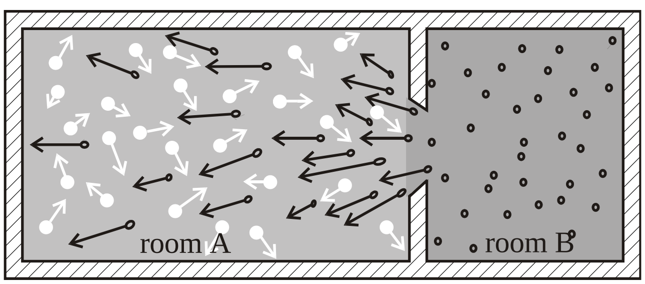

Figure 4 Experiment “rocket”

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