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Magnetism And Gravitation As A Result Of Geometric Changes In The Electric Field Caused By The Translation Of The Charges

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Abstract: It is clear that an electric field of moving charges is geometrically changed by this motion. A new representation way of this change will be shown here. With the help of this representation the magnetic effect can than be calculated directly from the geometric change in the electric field. The analysis of different reference systems/frames (as in the special theory of relativity) is not necessary for doing this. (The geometric changes, of course, still do arise from the special theory of relativity, however.) Finally, through these observations, it may be noted that gravitation is also an effect of the translation of charges, which can be represented mathematically here. So: under consideration of the special theory of relativity, geometrical changes in the electric field caused by translation produce magnetism and gravitation.

Key words: special theory of relativity, electric field, magnetism, gravitation
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1. Preface

The magnetic effect has already been described and explained in multiple ways and the correctness of these explanations shall not be questioned here. A gap shall merely be closed here: Classical physics simply regards the existence of a magnetic field as given and calculates this with the help of experimental data. The special theory of relativity [1] dictates that whether a field effect is electric or magnetic is dependant on the location (inertial reference frame). What is now missing is the following: In both cases it can be recognized that the magnetic field arises from the motion of charges. Well, an observer should now be able to calculate the magnetic field directly in his own observation system just from the geometric changes in the electric field resulting from the motion of the charges, without the analysis of other reference systems. It is all about to show how a magnetic effect arises for an observer, although the electrostatic field is balanced (electrically neutral) and although this electrostatically balanced field is the reason for the magnetic effect. How this can be done will be described in this work.
Furthermore the considerations regarding the field change by the translation of charges made here have revealed yet another, interesting connection: Apart from the magnetic effect, it appears that a further effect arises, which has an gravitation, which can be equated with the mass gravitation. This effect can be described mathematically. From this, it can then be shown how anti-gravitation can arise and be produced, as already indicated through the experiments into the magneto-gravitation (magnetic gravity effects) [2, 3]. Correlations between the electric effect, the magnetism and the gravitation were already described in multiple phenomena. [4, 5, 6, 7, 8, 9, 10]

2. Basic concept

2.1 General

In this chapter (2), I will start by introducing the basic idea, before going into greater detail. The electrical field is a spatial sphere of action spreading out at light speed. The electric effect is regarded as given here. The reason for the emergence of the electrical effect is part of another work, "Theory of Space Objects", which will not be discussed further here.

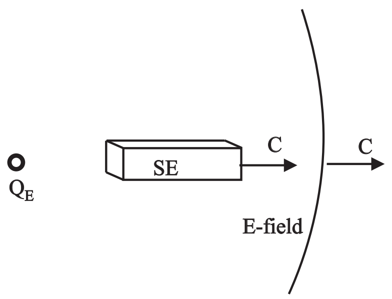

Figure 1.a Spatial little part (SE) of elektric field

It has appeared to be extremely practically to look at only small, spatial sections (therefore sub-areas) of the electric field always (to this, see Figure 1.a). In Figure 1.a the Q_E is a resting, field producing charge; SE is the spatial section of the electric field, and c - as it will always be referred to here - is light speed. (Everything becomes the simplest if SE is rectangular.)

For a moving charge Q_E the SEs then look as in Figure 1.b. Here, the velocity of Q_E (therefore V_E) was chosen to be $V_E \approx 0.5 * c$. One immediately recognizes that for the SEs with c rectangular ($c_\perp$) to V_E (therefore $SE_\perp$) the angle φ_E to c arises. It is now exactly this angle, which causes the magnetic effect. (Of course, the lengths and the angles of the SEs arise from $\vec{V}_E + \vec{c}$.) So that an electric effect can take place, the electric field from Q_E must meet a charge Q_Q, or rather an SE of Q_E meets Q_Q. The charge Q_Q has for its part a spatial extent within which the electric effect can take place with the SE coming from Q_E. This area is called absorption area. If Q_Q moves, the combination of this motion with φ_E yields the magnetic effect. To show how the SEs interact with the absorption area, and how the magnetic effect arises from this, three cases are distinguished, which are treated now. (The corresponding calculations will follow in Chapter 3.)

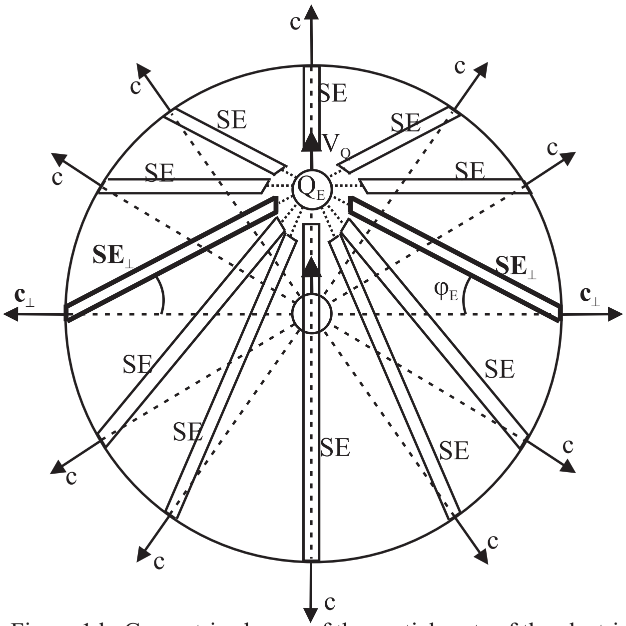

Figure 1.b Geometric change of the spatial parts of the electric field by V_Q of Q_E

2.2 Frontal case

In the simplest case Q_E and Q_Q move on a straight line. The absorption area of Q_Q and the emitting area of Q_E (which emits the SEs) are represented rectangularly, just like the SEs, because this simplifies the considerations. Of course, also in the absorption area of Q_Q spatial objects of electrical effect exist (arise), which are labelled as SQ in Figure 2. The effect intensity depends here on the SE volume, which is absorbed by Q_Q per time. The greater this is, the greater the effect is. However, this would mean that the electrical effect increases if Q_Q moves towards SE (Figure 2). On the other hand, simultaneous (caused by V_Q) the SQ_2 becomes longer than at $V_Q = 0$ where it has the length x_{Q0}. (Very analogous to the frequency change.) The length changes of the SQs caused by V_Q have to be understood as stretchings and compressions of the SQ_0 (with x_{Q0}). In turn, these stretchings and compressions have to be understood as stretchings and compressions of the effect intensity of Q_Q. The SE for its part interacts with that SQ, which moves in the same direction as itself. So it turns out that the stretching of SQ_2 undoes the increased absorption of the SEs caused by V_Q exactly. So we notice that the length change caused by V_Q of that SQ, with which the SE interacts (superimposes), **always** compensates exactly the also by V_Q caused absorption change. To generalize, the electric effect always depends **only** on the mutual distance of the charges, as long as they move on the same straight line, and **not** on their speeds.

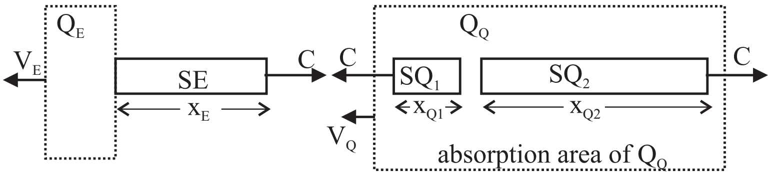

Figure 2 Frontal case: V_Q of Q_Q parallel to c of SE

2.3 Perpendicular case

Here now, Q_Q moves perpendicular to Q_E and we observe the SEs, which move parallel to V_Q. (Figure 3) From V_E the y_E arises. y_E is a stretching of the SE in the y direction. This means that this SE must have an effect on Q_Q in the y direction. This y-stretching corresponds to a

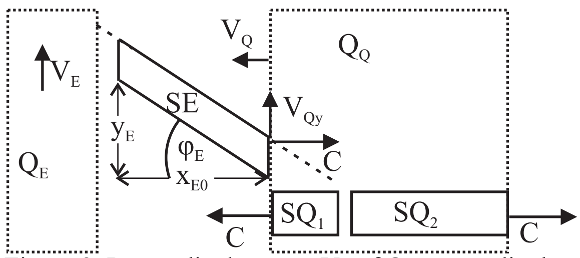

Figure 3 Perpendicular case: V_Q of Q_Q perpendicular to V_E of Q_E

state of tension, which unloads itself at the interaction with a "non-tensed" SQ again. Another way of imagining this is that the stretched (or generalized also the compressed) SE is adapted at the absorption by Q_Q to the stretching state of the SQ. In the example in Figure 3 this would lead to an effect on Q_Q contrary to the direction of V_E. On the other hand, at the same time, the velocity V_y relative to Q_Q results at the absorption caused by the angle φ_E what corresponds to a motion of the SE in this direction, therefore to an effect in this direction. For $V_Q = 0$ the effects of V_y and of the stretching in the y direction mutually cancel each other out exactly. Since by the stretching of SE in the y direction the length in the x direction hasn't changed (x_{E0}), the effect on Q_Q remains the same as for $V_E = 0$. If, on the other hand, Q_Q moves with V_Q, as in Figure 3, then V_y changes, while the stretching of SE remains the same. This means an additional effect in V_y direction proportional to ΔV_y. The calculations show that this corresponds exactly to the magnetic effect.

2.4 Parallel case

Now we look at the case when V_E and V_Q are not moving in a straight line but still are parallel, as in Figure 4.

From V_E the φ_E arises and from V_Q the φ_Q arises. The considerations and calculations are a little more circumstantial here, since for the absorption of SE the plane (surface), which emits the SQs in the same direction as the one in which SE also moves (with c), must be observed. For the calculation of this surface (in Figure 4 this is P_Q) the relativistic time difference in the direction of V_Q must be taken into account (the calculations follow in the next chapter). This surface (P_Q) is part of Q_Q, so it moves together with Q_Q, therefore it moves with V_Q. Now, if one looks (at Figure 4) at the absorption of SE_1 (from $V_E > 0$), SE_2 (from $V_E = 0$) and SE_3 (from $V_E < 0$) by P_Q one immediately recognizes that the corresponding absorption times are differently great, therefore $\Delta t_1 > \Delta t_2 > \Delta t_3$. This means that the effect of SE_1 in the x direction is smaller than that of SE_2 and analogously the effect of SE_2 is smaller than that of SE_3. The effect of SE_2 corresponds exactly (as it will be shown) to the electric effect here. This means that the effects of SE_1 and SE_3 are appropriately smaller or greater than the electric effect, what corresponds exactly to the magnetic effect.

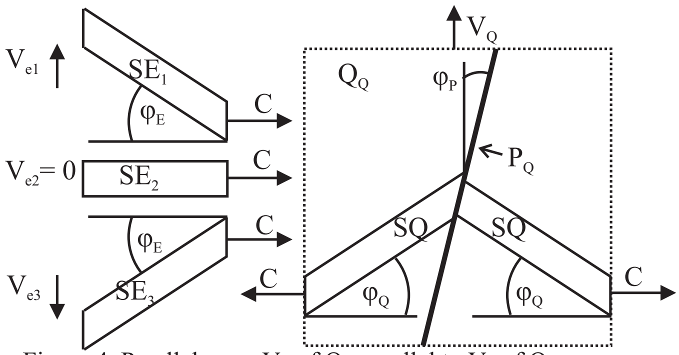

Figure 4 Parallel case: V_Q of Q_Q parallel to V_E of Q_E

There isn't any additional effect in the y direction, since the additional V_y corresponds exactly to V_Q so that its effect is undone exactly by the corresponding stretching.

The cases mentioned suffice for the description of the magnetism, since it is clear that any arbitrary motion can always be expressed in a perpendicular and a parallel component.

2.5 Gravitation

Since they are spatial objects, the SE also have a height H_E apart from the length x_E (not to be mistaken for y_E by V_E, see also Figure 7 in chapter 4). For the analysis of the magnetic effect H_E can, in principle, be neglected, since H_E is much smaller than x_E. However, this H_E produces gravitation. This results by the fact that the absorption time of the SE increases proportionally to H_E in *dependence of the speed* of the absorber. This means that the H_E reduces the effectiveness of the SE. So, if the H_E of the emitting electrons and protons are differently great then the total effect on a **moving** absorbing charge will not be zero anymore. This finally yields gravitation (at matter).
Here, the theoretical possibility of anti-gravitation also arises, particularly under consideration of the relativistic length contraction.

3. Calculations

3.1 Calculations frontal case

Here, in the frontal case it suffices to look at only the lengths in the x direction instead of the volumes. For $V_E = V_Q = 0$ the SE_0 and SQ_0 have the lengths x_{E0} and x_{Q0}. When Q_E and Q_Q have the velocities V_E and V_Q, it is: $x_E = (\vec{c} - \vec{V}_E) * \Delta t$ and $x_Q = (\vec{c} - \vec{V}_Q) * \Delta t$ (to this, see also Figure 2). At this, SE always superimposes with the SQ, which moves in the same direction (sign of $\vec{c}$). The superimposed effect arises from the product of the volume superimposed by SE in Q_Q with the effect density of this volume. Since the contained effect remains unchanged on the compression of SQ, therefore also is compressed, the effect density W_D results to $W_D = \frac{W_0}{x_{Q0}}$, were W_0 is the effect for $V_Q = 0$. So, the superposition effect (W_S) is: $W_S = x_E * \frac{W_0}{x_0}$. The time for the absorption of the SE by Q_Q arises to: $\Delta t_a = \frac{x_E}{\vec{c} - \vec{V}_Q} = \frac{\Delta t_0 * (\vec{c} - \vec{V}_E)}{(\vec{c} - \vec{V}_Q)}$. At this, Δt_0 is the time which was needed for the emission of the SE at $V_E = 0$. So, it is: $\Delta t_0 = \frac{x_{E0}}{c}$. It has to be taken into account that Δt_0 is independent of V_E - if relativistic effects are disregarded. So, the effect of SE on Q_Q is the superposition effect per time: $W = \frac{W_S}{\Delta t_a} = \frac{\frac{x_E}{x_Q} * W_0}{\frac{(\vec{c} - \vec{V}_E)}{(\vec{c} - \vec{V}_Q)} * \Delta t_0} = \frac{W_0}{\Delta t_0}$. (For $W_0 = 1$ and $\Delta t_0 = 1$ follows $W = 1$.) The $\frac{W_0}{\Delta t_0}$ corresponds to the electric effect for $V_E = V_Q = 0$. In principle, SE must always have the same effect per absorption time.

Now, shortly a word about time: Because of V_Q the time passes more slowly in Q_Q by $\sqrt{1 - \frac{V_Q^2}{c^2}}$. This leads to an additional stretching in the two directions (SQ_1 and SQ_2), by which SE superimposes a too little area at the superposition with SQ. However, this stretching of SQ isn't made by a V_Q but by a temporal delay of the emission of SQ. In the same way as Q_Q delays the emission of SQ, it also delays the absorption of SE. Through this the SE is compressed into Q_Q without, however, changing its length. However, this time caused compression of the SE by Q_Q generates the missing effect so that actually $W = W_0$ is. One can imagine this as follows: every dx of the SE is held shortly at the absorption for a corresponding dt, without thought that its length changes. The following dx then is compressed up and must be held shortly, too, so that the total length remains unchanged after the "letting off again". Each of these small on-compressions means an additional small effect.

3.2 Calculations perpendicular case

At the previous, we have seen that at the interactions both the length changes of SE and these of SQ must be taken into account. In the frontal case, length changes and velocities cancel each other out mutually. In the perpendicular case to be described here, the same is valid in principle. Since the vertical stretching (y direction) doesn't change the conditions in the x direction (x_E), the x direction corresponds to the frontal case (therefore only electric effect).

Because, however, of the angle φ_E, which SE has to the x direction (see Figure 3), a velocity of SE in the y direction of Q_Q arises at the absorption. As long as $V_Q = 0$ is, this V_y corresponds exactly to the stretching of SE in the y direction, what means that the effects cancels each other out mutually, exactly as in the frontal case.

The velocity $\vec{V}_y$ can be calculated very easily: $\vec{V}_y = \frac{\vec{y}_E}{\Delta t}$. Here Δt is the absorption duration of SE by Q_Q with: $\Delta t = \frac{x_E}{\vec{c} - \vec{V}_Q}$ For y_E it is: $\frac{y_E}{x_E} = \frac{V_E}{c} \Rightarrow y_E = \frac{V_E * x_E}{c}$, so that $\vec{V}_y = V_E * \frac{\vec{c}}{c} - \frac{V_E * \vec{V}_Q}{c}$. For $V_Q = 0$ it is $V_y = V_E$. Here $V_E * \frac{\vec{c}}{c}$ is the rest part of V_y and has no effect. So, the SE has the effective $\vec{V}_y = -\frac{V_E * \vec{V}_Q}{c}$ in the y direction. If so the SE has the effect W_0 in the x direction, then it has the effect $W_0 * \frac{V_E * V_Q}{c}$ in the y direction. Since the (proper) velocity of SE **always** is $\vec{c}$, it is $W_0 \sim c$. That means that $W_y \sim V_E * V_Q$. Since the SE effect in the x direction is exactly the electric effect, W_y corresponds exactly to the magnetic effect. At this, the directions of V_E and V_Q do not matter at all as long as they remain perpendicular on each other.

3.3 Calculations parallel case

There aren't any additional effects in the y direction, here, since the V_Q and the stretchings and compressions in the y direction caused by V_Q and the stretchings of the SEs in the y direction tally exactly and cancel each other out mutually just as in the frontal case.

Here again in the x direction we look at the superpositions of the SEs and SQs, which move in the same direction. This, now, **must** be calculated relativistically, however, because the surface, which emits the SQs in the x direction, is **not** perpendicular to the x direction! The slope of this surface (P_Q in Figure 5.a, see also Figure 4) is calculated now. The shift y_E of SE is (nearly) even (when SE is far enough away from Q_E). The same also applies to SQ. So we look for the one gradient of P_Q (in Q_Q), which produces an y-plane, which moves with the speed c in the x direction. If, so, at a place A_1 (in Figure 5.a) of Q_Q a SQ starts at $t_{A1} = 0$ in the x direction, then it covers the way

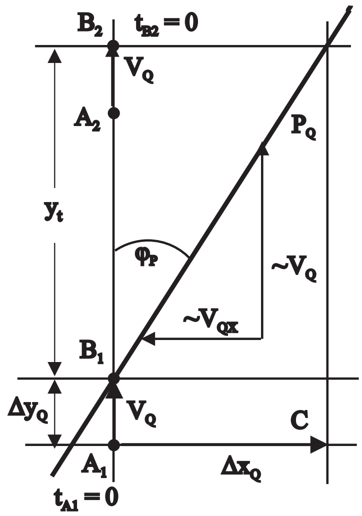

Figure 5a Calculation of emitting surface P

$x_Q = \Delta t * c$ during the time Δt, and Q_Q covers the way $y_Q = \Delta t * V_Q$ reaching B_1. We are looking now for the place A_2 at which $t_{A2} = -\Delta t * \sqrt{1 - V_Q^2 * c^{-2}}$ is, while at A_1 it is $t_{A1} = 0$. Of course, during Δt the A_2 has covered the distance $\Delta t * V_Q$ (reaching B_2). The gradient of P_Q results from the distance of A_1 to A_2 (therefore y_t) (or from B_1 to B_2) in the y direction and from x_Q. So it is that the relativistic time difference per length unit in the y direction (V_Q direction) caused by V_Q must be $\frac{\Delta t_Q}{y_t}$ in which $\Delta t_Q = \Delta t * \sqrt{1 - V_Q^2 * c^{-2}}$ is. So it is:

$$-\frac{V_Q}{c^2 * \sqrt{1-V_Q^2 * c^{-2}}} = \frac{\Delta t * \sqrt{1-V_Q^2 * c^{-2}}}{y_t} \Rightarrow y_t = \frac{c^2 * \left(1-V_Q^2 * c^{-2}\right)}{V_Q} * \Delta t$$

. Therefore, the gradient of P_Q is:

$$\frac{y_t}{x_Q} = \frac{\frac{c^2 * \sqrt{(1-V_Q^2 * c^{-2})} * \Delta t}{V_Q}}{c * \Delta t} = \frac{c * (1-V_Q^2 * c^{-2})}{V_Q}$$

. Equation (3.3.1)

At next, we are interested in knowing with which velocity P_Q moves along the (motionless) x-axis (that is V_{Qx}). From the gradient of P_Q immediately results:

$$\frac{V_Q}{V_{Qx}} = \frac{y_t}{x_Q} = \frac{c * (1-V_Q^2 * c^{-2})}{V_Q} \Rightarrow V_{Qx} = \frac{V_Q^2}{c * (1-V_Q^2 * c^{-2})}$$

. Equation (3.3.2)

Now it is directed to determine the time (Δta), which passes for the absorption of SE by P_Q (of Q_Q), though without taking into account the height H_E (see chapter 2.5) since this is uninteresting here. From the gradient of P_Q follows: $\frac{\Delta x_Q}{\Delta y_Q} = \frac{V_Q}{c * (1-V_Q^2 * c^{-2})}$ Equation (3.3.3) and from the gradient of SE follows: $\frac{x_E}{\Delta y_Q} = \frac{c}{V_E}$ Equation (3.3.4). From (3.3.3) and (3.3.4) follows: $\Delta x_Q = \frac{x_E * V_E * V_Q}{c^2 * (1-V_Q^2 * c^{-2})}$ Equation (3.3.5). If the zero point of the coordinate system ($x = y = 0$) is set at the place of SE at which the absorption starts then the absorption time becomes: $\Delta ta = \frac{\left|x_E - \Delta x_Q\right|}{V_{Qx} + c}$. Inserting (3.3.2) and (3.3.5) yields: $\Delta ta = \left|\frac{x_E}{c} * (1-V_Q^2 * c^{-2}) - \frac{x_E}{c} * \frac{V_E * V_Q}{c^2}\right|$.

If e.g. one takes only the magnitudes of SE_1 and SE_3 (see at Figure 5.b) then it is: $\Delta ta_1 = \frac{x_E}{c} * (1-V_Q^2 * c^{-2}) + \frac{x_E}{c} * \frac{V_E * V_Q}{c^2}$ and $\Delta ta_3 = \frac{x_E}{c} * (1-V_Q^2 * c^{-2}) - \frac{x_E}{c} * \frac{V_E * V_Q}{c^2}$. For SE_2 it is: $V_E = 0$ therefore $\Delta ta_2 = \frac{x_E}{c} * (1-V_Q^2 * c^{-2})$. For $V_E = 0$ the magnetic field must actually be zero, so it actually should exist only the electric effect. The Q_E and Q_Q move here parallel in the y direction, so they don't have any relative velocities in the x direction (which is the perpendicular connecting line). So the pure electric absorption duration actually should be $\Delta te = \frac{x_E}{c}$. Obviously, this doesn't apply to Δta_2. Actual it is $\Delta ta_2 < \Delta te$ since $(1-V_Q^2 * c^{-2}) < 1$ is. If the absorption duration of a not compressed SE becomes smaller while its effect shall remain W_0, then the SQ with which it superimposes must be stretched. So let us look at the SQ, which is generated by P_Q. The emission surface P_Q moves with V_Q from which the velocity V_{Qx} in the x direction arises because of φ_P. Because of V_{Qx} the SQ is stretched exactly as in the frontal case through which the effect of SE_2 is reduced just as it corresponds to its absorption time (Δta). Different than in the frontal

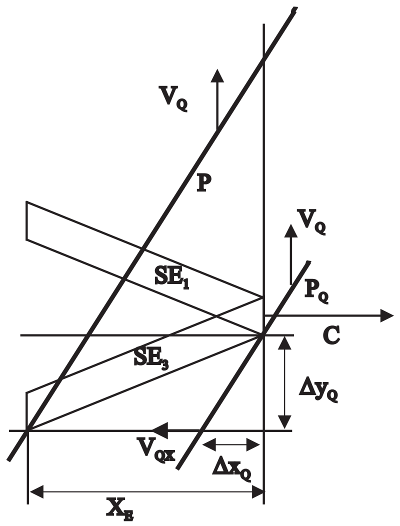

Figure 5 b Calculation of absorption time $\Delta t_{(a)}$

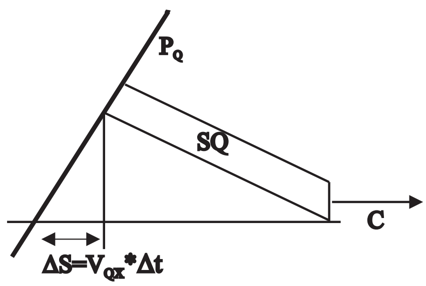

Figure 5 c The stretching of SQ

case, here SQ moves along P_Q, according to the V_Q (see Figure 5.c), through which the stretching is lost again for SQ. Along a motionless x line, however, this stretching takes place and is effective. The stretching of SQ (respective its effect) along an (motionless) x line is calculated to be: $\frac{c*W_0}{c+V_{Qx}} = W_{Qx} \Rightarrow W_{Qx} = c*W_0*\frac{(1-V_Q^2*c^{-2})}{c}$. So it turns out that both Δta_2 and W_{Qx} are smaller by the same factor. This means that SE_2 has exactly the electric effect. In other words: $\Delta ta_2 = \frac{x_E}{c}*(1-V_Q^2*c^{-2})$ represents the electric part of the effect. Consequently, at Δta_1 and Δta_3 the $\frac{x_E}{c}*\frac{V_E*V_Q}{c^2}$ represents the magnetic parts. At this, it is $\frac{x_E}{c} = \Delta t_0$, and V_E and V_Q can be expressed as multiples of c through which the c^2 in the denominator shortens out itself.

How can this result be interpreted now? Although we knew till now that with SE there are absorbed volumes it sufficed to look at straight lines only. Here now the volume has to be considered. If one leaves out the initial and final process of an absorption process (which are seen relatively very short), then the absorbed volume depends only on the length and the angle of the P_Q surface with which Q_Q can absorb (the z direction is here uninteresting since it is perpendicular to V_E and V_Q in the parallel case). If one disregards the relativistic compression, which is produced by V_Q at Q_Q in the direction of V_Q, then P_Q always changes by V_Q in exactly that way, so that the emitted volume (and therefore also the absorbed volume) always becomes (remains) equally grate. And this volume is exactly as grate as in the case of $V_Q = 0$! In the end, a stretching (sliding) perpendicular to the motion direction doesn't cause any volume change. (See Figure 6 where Vol_S and Vol_E are the start and end volumes, which are represented here too greatly since the large length of the middle area cannot be represented completely.) The relativistic compression, of course, reduces the absorbed volume, but the effectiveness of Q_Q also increases in the same measure. The analogous also applies to the volumes of the SEs.

So, in a certain volume absorbed by Q_Q there are always equally many SEs, independently of the direction in which these are stretched. Since they contain the same volume as in the case $V_Q = 0$, they have at first exactly the electric effect, therefore W_0. In dependence, however, of their stretching angles (φ_E) the absorption of every *single* SE (of the volume absorbed by Q_Q) has lasted for $\pm\frac{x_0}{c}*\frac{V_Q*V_E}{c^2} = \Delta tm$ longer or shorter. In the e.g. negative case, so this means that Q_Q still had to absorb in addition for the period of time Δtm to receive the electric effect. While, though, Q_Q absorbs longer for the duration Δtm, a "neutral" volume, therefore a volume with the *electric* effect strength (W_0) is absorbed. This means generalized that Q_Q has absorbed (when $V_Q > 0$) more or less electric effect corresponding always exactly to $\pm\frac{x_0}{c}*\frac{V_Q*V_E}{c^2}$. One can easily recognize that this corresponds exactly to the magnetic effect. (It has to be heeded that Δta represents the complete effect; such is electric plus magnetic effect.)

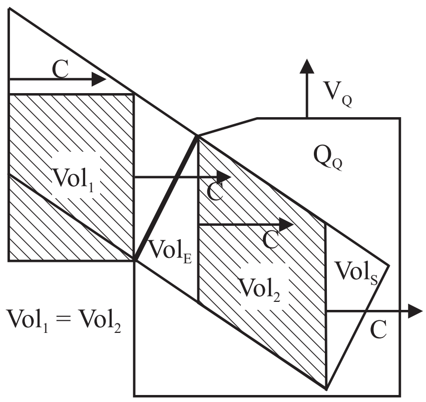

Figure 6 Equivalent volumes

So it was shown how the magnetic effect arises for parallel and perpendicular relative motions of electric charges. It almost goes without saying that an arbitrary relative motion can always be expressed in components therefore in a perpendicular and a parallel component.

4. Gravitation

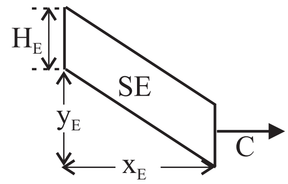

Figure 7 The height of SE

When looking at an SE one recognises that apart from the length x_E it also has a height H_E (not to be mistaken for y_E which arises from V_E) see Figure 7. The H_E is explained by the fact that Q_E, analogous to the Q_Q, also has a spatial extension inside which the emitting surface P_E (analogous to P_Q in Q_Q) is, and this P_E is determining H_E. The H_E has been neglected up till now since it is very small in relation to x_E. However, the H_E is responsible for the gravitation, as we shall now see.
Here now, we must look at the mode of action of the SEs in a little more detail. The electric effect (W) on an absorbing charge Q_Q arises essentially from the absorbed volume (Vol) per time (Δta) multiplied with the number (Z) of the SEs absorbed simultaneous. Therefore: $W = \frac{Vol}{\Delta ta} * Z$. At this it is: $Z = K * \frac{P_{Q\perp}}{H_E}$, were $P_{Q\perp}$ is the perpendicular part of P_Q in Q_Q (therefore with $\varphi_E = 0$) and K is a constant, which shall represent the numerical density of the SEs. For general considerations we put $K = 1$ for the simplicity. The volume is $Vol = T * H_E * x_E$ with $T = depth$ of SE in the z direction. Since T is uninteresting for symmetry reasons, it always is $T = 1$. So it is:

$$W = \frac{T * x_E * H_E}{\Delta ta} * K * \frac{P_{Q\perp}}{H_E} = \frac{x_E * P_{Q\perp}}{\Delta ta}$$ Equation (4.1).

So now, at the calculation of Δta the height H_E must be taken into account also. For the gravitation, though, it isn't necessary that the field forming charge Q_E is moving (therefore $V_E = 0$). So the magnetic effect and therefore also Δtm is abolished. The absorbing charge Q_Q however must move to get gravitation. So we calculate the absorption time now briefly, which results by H_E (Δta_H): From the triangle ABD in Figure 8 results under consideration of Equation (3.3.1): $\frac{\Delta y}{(V_{Qx} + c) * \Delta t} = \frac{c * (1 - V_Q^2 * c^{-2})}{V_Q}$. The velocity, which Q_Q or P_Q has relatively to H_E is:

$$V_{Qy} = \frac{\Delta y}{\Delta t} = \frac{(V_{Qx} + c) * c * (1 - V_Q^2 * c^{-2})}{V_Q} = \frac{c^2}{V_Q}$$. With that, it results: $\Delta ta_H = \frac{H_E}{V_{Qy}} = \frac{H_E}{c} * \frac{V_Q}{c}$. Therefore Δta is for

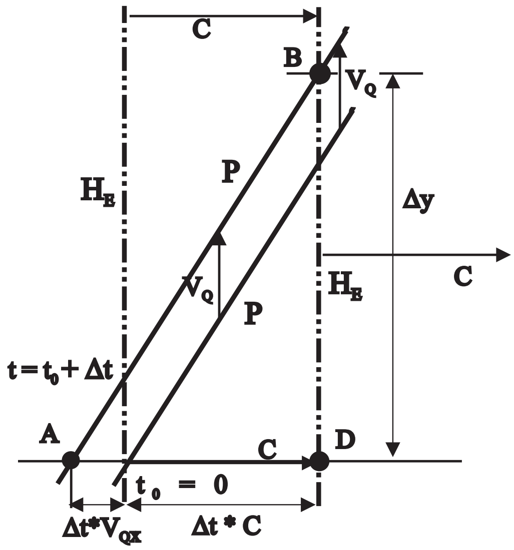

Figure 8 Calculation of V_{QY}

$V_E = 0$: $\Delta ta = \frac{x_E}{c} + \frac{H_E}{c} * \frac{V_Q}{c}$. Here Δta_H is **always** positive. So we recognize that the absorption time of a SE by Q_Q (therefore Δta) gets greater proportionally to H_E if $V_Q > 0$ is (V_Q of course is the magnitude of $\vec{V}_Q$), and analogous to equation (4.1) the effect gets appropriately smaller. From this a gravitative effect arises if the ratio $\frac{H_E}{x_E}$ depends on the sign of the charges! (The greater H_E is in relation to x_E, all the bigger its part (share) of the complete effect W_0 is.) The gravitation works as follows: In matter, therefore essentially in atoms, the electrons generally move faster than the protons. Even in plasma the electrons have higher speeds than the protons because of their smaller inertia. In simplified terms, one can assume that at the absorber (Q_Q) the protons rest and the electrons move. At the emitter (Q_E) both protons and electrons can be regarded as resting. The speed of the electrons is then considered retrospectively.

It shall be now so that the ratio $\frac{H_E}{x_E}$ is differently great for protons and electrons. This is represented graphically in Figure 9, were the SE_{e-} are the partial elements (subareas) of the electric field of the electrons (with $V_E = 0$) and the SE_{p+} that one of the protons, and in addition PQ_{e-} is the absorption surface of the electrons and PQ_{p+} that one of the protons.

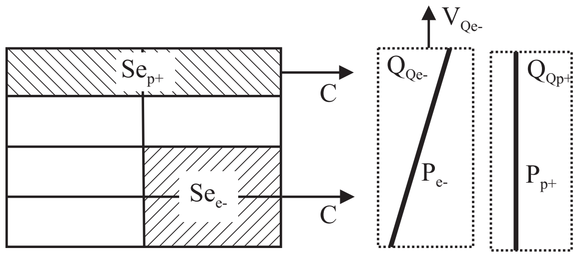

Figure 9 Hight of SE_{e-} and SE_{p+} absorbed by Q_{Qe-} or Q_{Qp+}

Since for the absorbing protons $V_Q = 0$ is, PQ_{p+} is parallel to H_E . From this, immediately arises that the effects of the SE_{e-} and SE_{p+} exactly cancel each other out mutually at PQ_{p+} . At PQ_{e-} , on the other hand, a rest effect remains. Since the absorption time is all the bigger the bigger $\frac{H_E}{x_E}$ is (at constantly grate x_E), and therefore the effect is all the smaller, one immediately recognizes that one gets an attraction if $\frac{H_{Ee-}}{x_{Ee-}} > \frac{H_{Ep+}}{x_{Ep+}}$ is! (This is already indicated in Figure 9.) With attraction, of course, it is meant the one between Q_E and Q_Q . Since protons are heavier than electrons, one could say: The bigger the mass, all the smaller $\frac{H_E}{x_E}$. This reminds the Compton wavelength - but to this more later.

Now, of course, we want to know which values $\frac{H_{Ee-}}{x_{Ee-}}$ and $\frac{H_{Ep+}}{x_{Ep+}}$ must have in order to produce gravitation. For this a ratio of an electric effect to a gravitational effect is calculated, which is representative for matter. The classic calculation delivers an acceptable value if one calculates the electric force in relation to the gravitational force of two protons ($\frac{F_{Ep+}}{F_{Gp+}}$). This makes sense since the mass of the electrons is negligibly small here (the neutrons will still need to be discussed). To the electric effect between two resting protons applies: $W_{p+} = P_{Q\perp} * c$. The gravitation on a moving electron, which is performed each by one resting proton and electron is: $\frac{x_{Ep+} * P_{Q\perp}}{\Delta t_{p+}} - \frac{xE_{e-} * P_{Q\perp}}{\Delta t_{e-}}$.

Here it already was presupposed, that the effect of the proton is the greater one so that in summary attraction results. So, the classic ratio between the electric and the gravitational effect corresponds to:

$$\frac{P_{Q\perp} * c}{\frac{x_{Ep+} * P_{Q\perp}}{\Delta t_{p+}} - \frac{x_{Ee-} * P_{Q\perp}}{\Delta t_{e-}}} = \frac{F_{Ep+}}{F_{Gp+}} \Rightarrow \frac{\left(1 + \frac{H_{Ep+}}{x_{Ep+}} * \frac{V_Q}{c}\right) * \left(1 + \frac{H_{Ee-}}{x_{Ee-}} * \frac{V_Q}{c}\right)}{\left(\frac{H_{Ee-}}{x_{Ee-}} - \frac{H_{Ep+}}{x_{Ep+}}\right) * \frac{V_Q}{c}} = \frac{F_{Ep+}}{F_{Gp+}}$$

equation (4.2). There are naturally four unknowns in this equation: H_{Ep+} , H_{Ee-} , x_{Ep+} and x_{Ee-} .

For $\frac{F_{Ep+}}{F_{Gp+}} \approx 1,24 * 10^{36}$ it is. For V_Q a average speed for the electrons in the atom is taken. A good, generously rounded value here is $V_Q = 0.05 * c$. The determinable part for recording the gravitation is completed here in principle. We nevertheless want to try to approach the proportion $\frac{H_E}{x_E}$.

To reduce the number of unknowns an assumption can be made here that, while not mandatory, would seem absolutely plausible: We presuppose the SEs of the protons and electrons to have the same volume despite the difference in the relations of $\frac{H_E}{x_E}$. So it is: $x_{Ep+} * H_{Ep+} * Z_{p+} = x_{Ee-} * H_{Ee-} * Z_{e-}$, in which the z direction is uninteresting for reasons of symmetry ($Z_{p+} = Z_{e-}$). With this, one of the unknowns can be eliminated. So, if e.g. H_{Ep+} and H_{Ee-} were known (e.g. by considering the structure of the elementary particles or the Compton wavelength) then equation (4.2) could be solved completely. To use equation (4.2) correctly, though, the fact must still be taken into account, of course, that the field producing electrons (with H_{Ee-}) also move. Therefore, the relativistic length contraction of H_{Ee-} must be taken into account. So we have: $H_{Ee-} * \sqrt{1 - V_Q^2 * c^{-2}}$. On the other hand, the magnetic part of the field producing electrons can be ignored since it can be assumed that the speeds of the electrons are allotted regularly in the resting atom and in matter respectively.

But, even without the corresponding knowledge about the structure of elementary particles, equation (4.2) provides some insight. So the numerator is ≈1 since always $H_E <<< x_E$ is. This means that the difference must be $\frac{H_{Ee-}}{x_{Ee-}} - \frac{H_{Ep+}}{x_{Ep+}} \approx 10^{-36}$ (4.3). From this it may be concluded that the difference of the $\frac{H_E}{x_E}$-proportions between protons and electrons is very small. Unfortunately there is as yet no reliable insight into this. It seems absolutely possible that H_E is inversely proportional to the inert mass of the charges as well as the Compton wavelength. Then it is: $H_{Ep+} << H_{Ee-}$ (4.4). Remodelling the difference (4.3) yields: $\frac{H_{Ep+}}{x_{Ee-}} * \left(\frac{H_{Ee-}}{H_{Ep+}} - \frac{H_{Ep+}}{H_{Ee-}} \right)$ and with (4.4) we get: $\frac{H_{Ee-}}{H_{Ep+}} - \frac{H_{Ep+}}{H_{Ee-}} \approx \frac{H_{Ee-}}{H_{Ep+}}$ from which $\frac{H_{Ee-}}{x_{Ee-}} \approx 10^{-36}$ follows. This means that H_{Ee-} is so small that it takes only a fraction of the size of a proton or electron. There is an interesting interpretation for this: Until now, SEs have been described as partial elements (sub-areas) of the electric field. They could, however, also be regarded as independent objects, which can be labelled as field quanta (or space objects, by which objects containing space is meant). Instead, therefore, that a uniform electric field arises, many SEs arise, of which *every single one* comes into being and is emitted for itself. The process of emergence for each SE can be explained for its part by considering the more complex processes taking place inside the charges in which oscillations should be substantially involved. From the kind of this process of emergence the absorption and emitting areas P_E and P_Q then result, too. Here, the $\frac{H_E}{x_E} \approx 10^{-36}$ reflects the spatial quantity of the proportions of this processes of emergence in the inside of the charges. Here, though, it only is all about a very rough estimate of the approximate order of magnitude. In fact $\frac{H_E}{x_E}$ can be considerably bigger than 10^{-36} since the difference of the $\frac{H_E}{x_E}$ between protons and electrons can be considerably smaller than their mass difference. Instead of the masses, the effective diameters of the charges could be substantial whose determination is tricky now in turn.

4.1 Neutrons

As far as it concerns the neutrons, it makes most sense to assume that they are electrically neutral because they contain equally negative and positive electrical charges. Here, the $\frac{H_E}{x_E}$ relations of the positive and negative neutron charges are different, just as in the case of the protons and electrons, meaning that neutrons also have a gravitational effect on matter. If, in addition, one assumes that this charges move in the inside of the neutrons, and if also here the negative charges have greater speeds than the positive charges, then neutrons can also be influenced gravitationally. This, however, cannot be considered proven unless neutron stars are shown to be attracted gravitationally by other stars. The

exact values attributable to the $\frac{H_E}{x_E}$ relations of the positive and negative charges of the neutrons may not necessarily be the same as seen in protons and electrons. This can absolutely depend generally on the kind of the elementary particles and from this then the exact gravitational interaction mode (strength) of the respective particles arises.

4.2 Anti-gravitation

Anti-gravitation arises automatically if, at the absorber (Q_Q), the charges of the protons and electrons are swapped; because then the positive charges are the one with the greater speeds. This leads directly to the conclusion that antimatter is also associated with anti-gravitation. Of course, the charges shouldn't also be swapped at the emitter (Q_E) therefore it may not be of antimatter. Following this logic, attraction exists once again between antimatter and antimatter.
For certain it isn't easy to produce anti-gravitation in a technical way. To cause the anti-weight of one kilogram, one should put into motion exactly as many positive charges as there are electrons in the kilogram of matter. In addition, the speeds necessary would be considerable. Perhaps one could let big quantities of hydrogen cores rotate fast, however, to prove the effect at least?
Another possibility for anti-gravitation has been seen in magneto-gravitation. Here, a strongly cooled disc is simply set into fast rotation. [11, 12] Anti-gravitation then arises in the direction of the axis of rotation. This is explained as follows: from the view of an observer standing perpendicular to the rotating disc in the direction of the axis of rotation (in Figure 10 this is, for example, at point B) both the protons and the electrons move with the additional velocity V_D of the rotation. Caused by V_D both the SE of the electrons (SE_{e-}) and those of the protons (SE_{p+}) have a relativistic length contraction in H_E direction. A reduction in height (H_E) means a reduction in the absorption time (Δta), which corresponds to a magnification of the effect. Since, however, it is $H_{Ee-} > H_{Ep+}$, this length contraction affects the electrons proportionally more than it does the protons. This corresponds to a reduction in the difference $\frac{H_{Ee-}}{x_{Ee-}} - \frac{H_{Ep+}}{x_{Ep+}}$ (of the electrons and protons), which finally means a reduction in the gravitation. A reduction in gravitation is, in principle, nothing else but anti-gravitation. It would certainly be interesting to see whether magneto-gravitation can be explained by this effect. Why strong cooling is necessary here, is not clear. It is possible that compensatory currents (and/or compensatory movements) are prevented by the low temperature. It may be that the effect is, at higher temperatures, already superimposed too strongly by the thermal motions of the atom trunks. Perhaps, at some point, such observations might be considered by “ARC Seibersdorf research GmbH”.

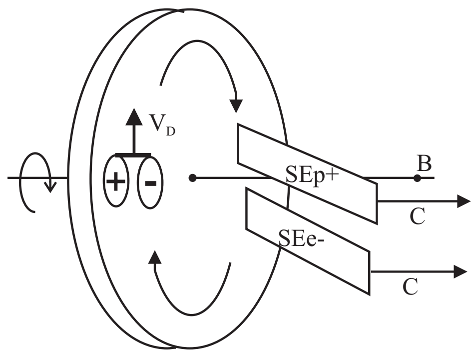

Figure 10 Antigravitation by rotation

4.2.1 Energy gain by anti-gravitation The following sequence is conceivable: A disc is set into fast rotation. Then we withdraw as many electrons as possible from the disc, so that more positive than negative charges rotate. Thereby the disc acquires anti-gravitation and has less weight, within the gravitational field of the earth. Next, the rotating disc is heaved by the height Hg, against the gravitational field of the earth. Then the disc is loaded with as much negative electrical charge as possible, causing its weight to increase. Finally, the disc is dropped back again by the height Hg to its starting point. Potential energy is gained through the differences in weight respectively with- and against- the Earth's gravitational field. Of course, the electrical charging and discharging of the disc also requires energy, but the energy quantity required here is, for the same charges quantity, constant, while potential energy achievable is dependent on the height of Hg. So, one must only make the height Hg grate enough to receive energy gain.
In terms of implementation rotating discs are imaginable, which would themselves produce the alternating current, they require, and which produce furthermore some additional energy. For this, both big macroscopic and small microscopic discs are conceivable.

Another alternative would be to omit the charging and discharging process and instead use two permanently oppositely charged discs whose rotational force would always be transferred from one to the other at the high and low points without, ideally, rotational energy being lost. Here, also, the energy requirements of the rotational energy transfer is independent of the energy gained as a result of height Hg.
But, which is the origin of this energy gain, however? Well, in principle, the gravitational field of the earth has energy similar to that seen in a magnetic or an electric field. Anti-gravitation weakens the gravitational field in sum, and this is where the energy gain described above arises. The potential of this process is such that, if one practised this method of power generation on an extremely large scale, it could (theoretically) even disturb the equilibrium of the solar system.

5. Closing remark

A number of conclusions still can be drawn from the idea developed here, which may also lead to experimental checks. One could, for example, try to find out how much the high speed of the atomic nuclei (protons) in the plasma of the sun influences the gravitation of the sun. One could also try to find out how much the decay of a neutron to a proton and an electron influences their gravitation in sum. Especially in the field of astronomy, some quite funny connections arise, which haven’t been discussed yet.
Of course, not all effects of the basic idea could be treated here. For example the relativistic conditions for space and time have not been treated comprehensively. Neither have the start and end conditions for the absorption of volumes been taken into account, nor were acceleration processes examined. There remain many more effects to discover and to examine, and the necessity of a sensible mathematical development needs no discussion.
It is my hope that the idea put forward here may provide stimulation to further investigation and research into the subject.

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