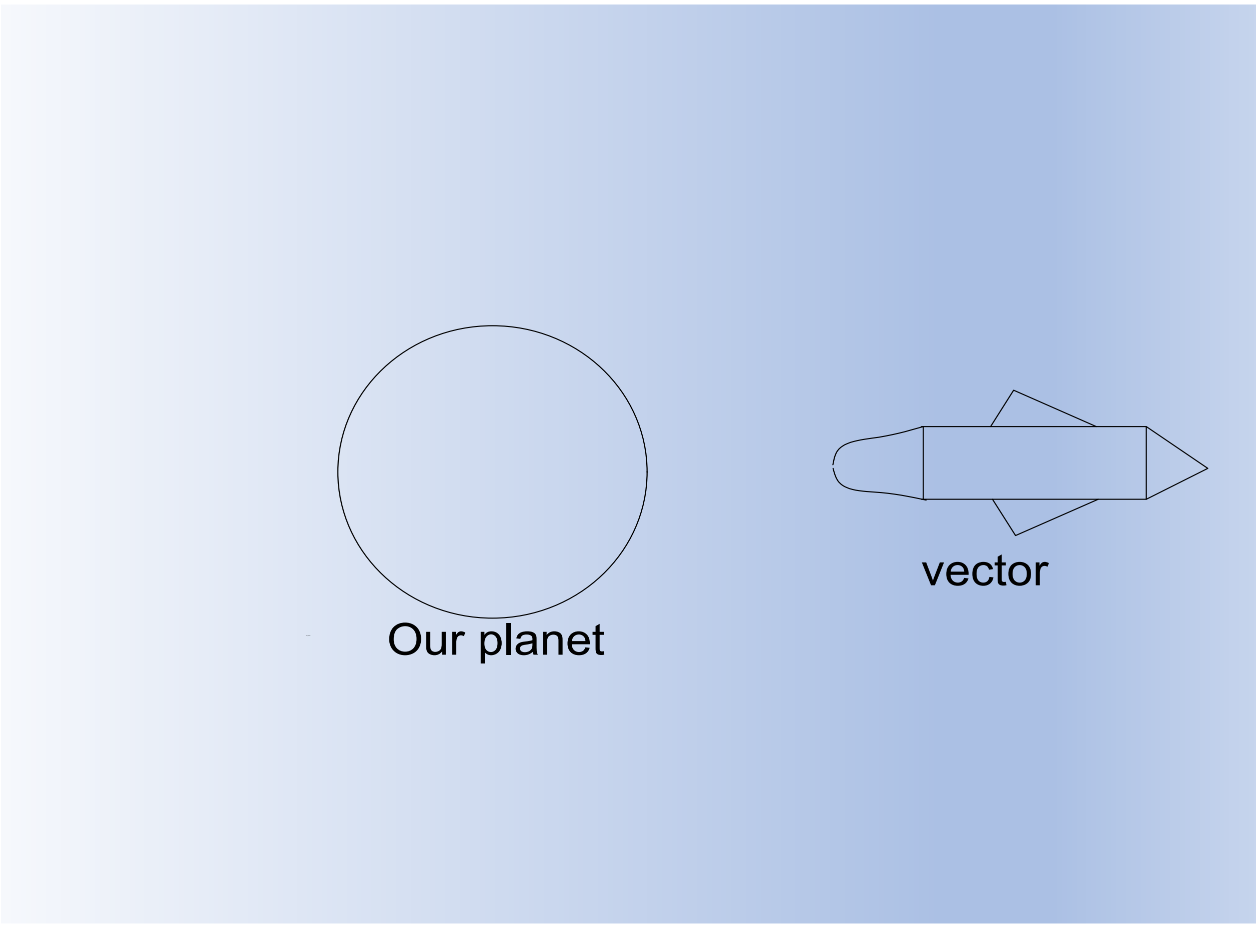
This document shows a different way to calculate the relation of time dilation.
We supposed to have two system of reference: one of this is our planet and the second of these is a spatial vector, that move which respect our planet, with a constant speed, near the light speed.



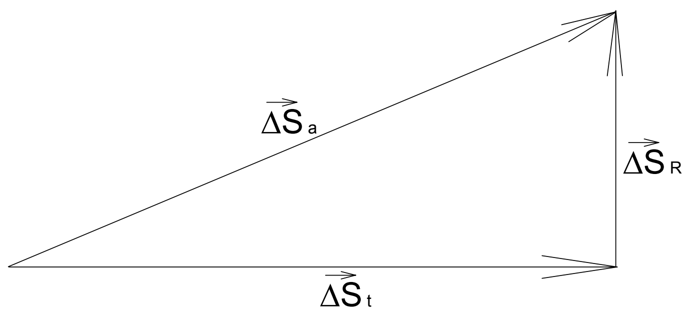
The speed of light is constant, regardless of the reference system chosen to measure it.
We, now, imagine that the spatial vector, move with a speed very close to which of the light.
We name "V" the speed of spatial vector, with respect our planet.
We imagine, inside the spatial vector a material point, that moves upwards, also it self at a speed close to that of light.
We name with "v" this speed.
We have:
V: velocity of the space vector with respect to our planet [m/s]
v : velocity of material point with respect to spatial vector [m/s]

We consider, now, an interval of time Δt_0 measured by a watch of our planet.
In this range of time, the spatial vector describes a space equal to product of "V", velocity of spatial vector, respect to our planet, for Δt_0
The material point, in the same interval of time “Δt_0", move upward. We name this movement $\Delta \vec{s}_h$
To calculate the absolute movement of material point, respect to our planet, we must sum two movement: that of the material point with respect to the space vector, plus that of the space vector with respect to the earth.

We have:

$\Delta\vec{S}_a$: movement absolute of material point respect to earth
$\Delta\vec{S}_R$: movement of material point respect to space vector
$\Delta\vec{S}_t$: movement of space vector respect to earth

We have the following vector scheme:



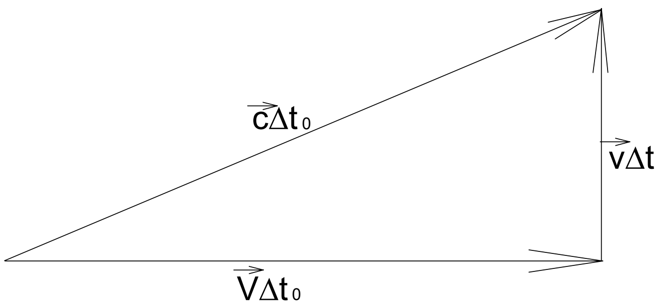
Now, we must consider a fundamental notion: we can't overcome the light velocity!
We reason for absurd, we suppose the range of time in the earth is equal to the range of time in the space vector. We have:

$$\Delta S_a = V\,\Delta t_0$$
$$\Delta S_r = v\,\Delta t_0$$

$$\Delta S_a = \sqrt{V^2 \Delta {t_0}^2 + v^2 \Delta {t_0}^2} = \Delta t_0 \sqrt{(V^2 + v^2)}$$

Because the velocity "v" and "V" are very close to that of light, is plausible that the quantity "$\sqrt{(V^2 + v^2)}$" is greater than the speed of light. It isn't possible! The only way to get out of the impasse is to admit that **the time interval spent inside the space vector, is smaller than the one spent on earth.**

We name the time elapsed inside the space vector "Δt".
Now, we build the movements triangle in this way:



We apply the Pythagorean theorem to the triangle above:

$$c^2\Delta t_o^2 = V^2\Delta t_0^2 + v^2\Delta t^2$$

$$\Delta t_o^2(c^2 - V^2) = v^2\Delta t^{\,2}$$

$$\Delta t_o^2 = \frac{v^2\Delta t^2}{(c^2 - V^2)}$$

$$\Delta t_0 = \sqrt{\frac{v^2\Delta t^2}{(c^2 - V^2)}}$$

FINAL RELATION_00

$$\Delta t_0 = \sqrt{\frac{v^2}{(c^2 - V^2)}}\Delta t$$

FINAL RELATION

$$\Delta t_0 = \sqrt{\frac{1}{\left(\frac{c^2}{v^2} - \frac{V^2}{v^2}\right)}}\Delta t$$

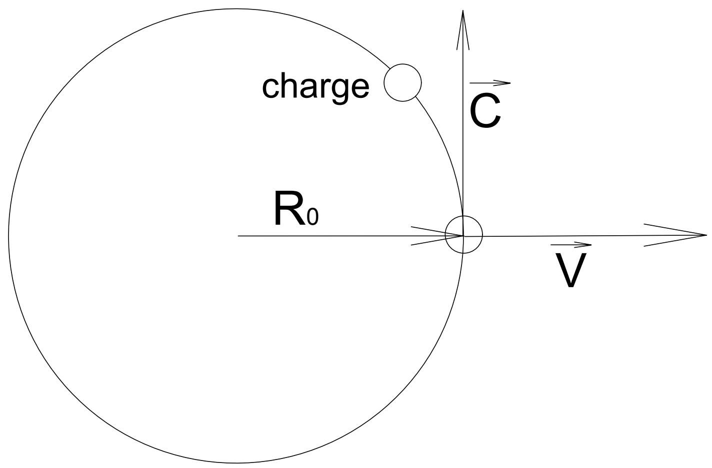
The FINAL relation obtained is valid only if the quantity "$\sqrt{(V^2 + v^2)}$", is greater than the speed of light. Only in this situation, in fact, is plausible to consider the range of the time inside the space

vector "Δt" , smaller than the range of the time "Δt_0", when "Δt_0", is the time elapsed respect to earth.
Only if the velocity of event inside the space vector, becomes equal which respect to velocity of light, my FINAL relation is equal to relation obtained. In fact, if v = c, the final relation becomes:

STANDARD EQUATION

$$\Delta t_0 = \sqrt{\frac{1}{\left(1 - \frac{V^2}{c^2}\right)}}\Delta t$$

We consider the FINAL RELATION_00, and we suppose that an electron is motionless with respect to space vector. In this situation there is no dilation of time. The time elapsed for the electron inside the vector should be equal to time elapsed for electron with respect to earth. It isn't true! The phenomen of time dilatation is present.
To get out of the impasse, we imagine as model of an electron, a current loop. In other words, a charge that rotates around a central point. The velocity of this charge with respect to central point is equal to light velocity. Assuming this model for the electron, we can proceed in the following way:



We can applicate the standard equation for time dilation. We suppose that R0 is the geometric ray at rest of electron and we indicate with T0 the time taken from the charge to make a complete turn. The charge moves around the central point with a velocity equal to light velocity. Is possible to write the period T0, in the following way:

$$T_0 = \frac{2\pi R_0}{c}$$

We applicate the standard equation:

$$\Delta t_0 = \sqrt{\frac{1}{\left(1 - \frac{V^2}{c^2}\right)}}\Delta t$$

We solve the last written equation with respect to $\Delta T = T$
The physical quantity "T" represents the rotation period of the charge, taking into account the relativistic effect.

We have:

T [s] rotation period of the charge, taking into account the relativistic effect
T_0 [s] period of the charge, when the electron is moveless with respect to earth.
We consider, also, the relations f = 1/T and f_0 = 1/ T0.

We obtain the following relations:

$$T_0 = \sqrt{\frac{1}{\left(1 - \frac{V^2}{c^2}\right)}}T$$

$$T = \sqrt{\left(1 - \frac{V^2}{c^2}\right)}T_0$$

$$T = \frac{2\pi R_0}{C}\sqrt{\left(1 - \frac{V^2}{c^2}\right)}$$

We put:

$$f_0 = \frac{c}{2\pi R_0}$$

And we put

$$f = \frac{1}{T}$$

We obtain:

$$f = \frac{f_0}{\sqrt{(1 - \frac{v^2}{c^2})}}$$

The last equation shows a very important result: The frequency of the charge changes when the electron velocity increases, with respect the earth. If the velocity is increasing, the same frequency is increasing.

If we want to calculate the current determinate from the charge that rotates around the central point, we can calculate the ratio "q/T"

We have:

$$i = \frac{q}{T} = \frac{q}{\frac{2\pi R_0}{C}\sqrt{\left(1 - \frac{V^2}{c^2}\right)}}$$

This current determines a magnetic field:

$$B = \frac{\mu_0}{2\pi}\frac{i}{R_0} = \frac{\mu_0}{2\pi R_0}\frac{q}{\frac{2\pi R_0}{C}\sqrt{\left(1 - \frac{V^2}{c^2}\right)}} = \frac{\mu_0 qC}{4\pi^2 R_0^2\sqrt{\left(1 - \frac{V^2}{c^2}\right)}}$$

The model of electron is like a spire crossed by current. We can calculate the magnetic field flow passes through this coil. We name the flow "$\phi(B)$", and we name A the area of coil. we have:

$$\phi(B) = BA = \frac{\mu_0 qC}{4\pi^2 R_0^2\sqrt{\left(1 - \frac{V^2}{c^2}\right)}}\,\pi R_0^2$$

$$\phi(B) = \frac{\mu_0 qC}{4\pi\sqrt{\left(1 - \frac{V^2}{c^2}\right)}}$$

The velocity of electron is variable over time, so also the flow of the magnetic field is variable over time. We can calculate the electromotive force generated in the coil.

This electromotive force, different from zero, of course, represent the inertia of coil when an external agent would like to change the velocity of coil same.
Therefore, if we want to change the velocity of electron, must change the electromotive force. In other words, if we want to change the velocity of electron, we encounter in a anti-electromotive force of an exquisitely electric nature.
This shows that mass, understood as an inertia opposed by a certain object, at our attempt to vary its state of quiet or motion, has basically an electrical nature.