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Special Relativity Electromagnetic and Gravitation combined Into one theory

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Introduction

In this paper, I try to combine Electromagnetic and Gravitation into one theory, using hidden parameters of Special Relativity.

Assumption

The electron charge cannot be separated from the electron mass. Both are "connected "to the same particle. This is true for all other "elementary particles". In electricity and electronic we can accumulate charge only on capacitors, so I assume that particle mass is the capacitor mass that hold the particle charge.
Of course, such an assumption must agree with all other theories like Relativity Gravitation Electromagnetic etc
I paid attention that "Transmission lines" behave mathematically according to Special Relativity, (3D electromagnetic cavity also) , hence I used the Transmission line to explain why "Space Time" is the "capacitor" of particle charge. The final conclusion was that the entire universe is an electromagnetic cavity. The electromagnetic waves create AC currents in the "mass capacitance" and the mass move according to professor Einstein equations. But Gravitation waves does not exists.

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Definitions

m_0 , m_T	Rest mass and moving mass
μ_0	Vacuum permeability
μ_R	Relative permeability
ε_0	Vacuum permittivity
ε_R	Relative permittivity
c_0	The speed of light in vacuum
c	The speed of light in matter
v	The mass velocity relative to the lab
$\beta = \frac{v}{c}$	slip
C_X	Capacitance
α	Capacitor quality factor

Elementary particles

The table below contains a lot of information about known elementary particles, but one important column in this table is missing. And I am going to explain what column is missing and why.

The charge of an elementary particle (see the elementary particles table above) can be ± 1 , $\pm {}^{1}\!/_{3}$, ${}^{2}\!/_{3}$ or 0 electronic charge. The charge is limited in range and quantized. The mass range is varying wide. How we can explain it. Those who learn electrical engineering know that charge is always kept on the plates of a capacitor. If so, elementary particles have also capacitance. **The missing column in the table above is therefore the capacitance of each elementary particle.**

Electrical engineers know also that except charge there is also induced charge.

In the picture below [1] we see a single capacitor. Suppose its mass is m_0 and its capacitance is C_E . A good capacitor is a capacitor with a big $\frac{C_E}{m_0}$ ratio. So the capacitor quality factor can be defined as $\frac{C_E}{m_0}$ but My definition is entirely different and strange and the reasons will be explained later.

I define the capacitor quality factor α as follow

$$\alpha^2 m^2 = \frac{1}{C}$$

So, the quality factor for the capacitor in case [1] is $\alpha = 1$

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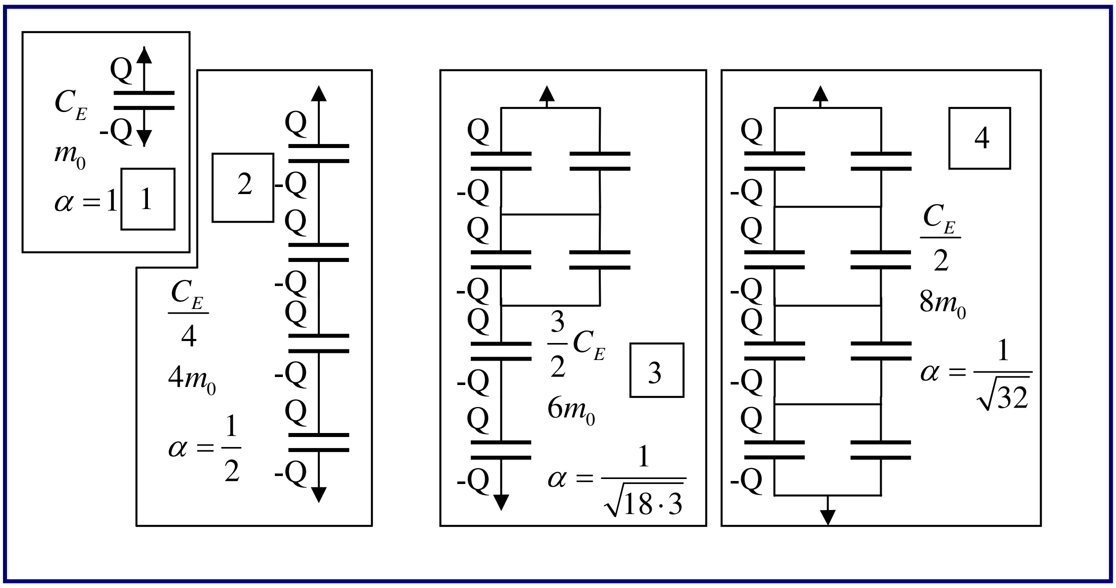
Standard Model Particles (nucleons included for comparison)

family			particle	predicted/	discovered	spin number	charge (e)	color	mass (MeV/c^2)
fermions	quarks	u	up quark	1964	1968	½	+⅔	r, g, b	2.3
fermions	quarks	d	down quark	1964	1968	½	−⅓	r, g, b	4.8
fermions	quarks	c	charm quark	1970	1974	½	+⅔	r, g, b	1,275
fermions	quarks	s	strange quark	1964	1968	½	−⅓	r, g, b	95
fermions	quarks	t	top quark	1973	1995	½	+⅔	r, g, b	173,200
fermions	quarks	b	bottom quark	1973	1977	½	−⅓	r, g, b	4,420
fermions	leptons	e	electron	1874	1897	½	−1	none	0.5110
fermions	leptons	μ	muon		1936	½	−1	none	105.7
fermions	leptons	τ	tau		1975	½	−1	none	1,777
fermions	leptons	ν_e	electron neutrino	1930	1956	½	0	none	$< 10^{-5}$
fermions	leptons	ν_μ	muon neutrino	1940s	1962	½	0	none	$< 10^{-5}$
fermions	leptons	ν_τ	tau neutrino	1970s	2000	½	0	none	$< 10^{-5}$
fermions	*	p	proton	1815	1917	½	+1	none	938.3
fermions	*	n	neutron	1920	1932	½	0	none	939.6
bosons	vector	g	gluon	1962	1978	1	0	8 colors	0
bosons	vector	γ	photon	1899		1	0	none	0
bosons	vector	W	W boson	1968	1983	1	±1	none	80,39
bosons	vector	Z	Z boson	1968	1983	1	0	none	91,190
bosons	**	H	higgs boson	1964	2013	0	0	none	125,900

* The proton and neutron are hadrons (made of quarks), baryons (made of three quarks), and nucleons (found in the nucleus).
** The higgs boson is the only known scalar boson.

particle families



Suppose all the capacitors in the picture above are the same. In case [2] the charge between two capacitors is induced charge. The equivalent capacitance of 4 capacitors

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connected in series is $\frac{C_E}{4}$ and the total mass of 4 capacitors is $4m_0$ so the capacitor quality factor for case [2] is $\alpha = \frac{1}{2}$ Case [3] and case [4] are solved in a similar way.

What we can learn from these examples?

Case [1], describe an electron. We sense the negative side of its capacitor. The electron has the best capacitor quality $\alpha = 1$

We know that the proton is positively charged and its mass is 1834 times the electron mass. So the proton is a very long chain of 1834 capacitors connected in series and we sense its positive side.

For the proton

$$\alpha^2 = \frac{1}{m^2 C} = \frac{1}{(1834 \cdot m_0)^2 \frac{C_E}{1834}}$$

Proton's capacitor quality factor is law compared to electron capacitor quality factor

If two protons collide in an accelerator like the LHC the capacitor series connection is broken. What we get is other capacitors series parallel connection. **Each combination of capacitors from our point of view is a different particle.**

Elementary particles that have no charge are two chains of charged particle in such arrangement that the total charge appear to be zero (ring). For example positron plus electron appears together as 2γ photons.

Intermediate Conclusions

All the particles are made from one block of "Lego" suppose it is the electron with mass m_0 and unknown capacitance C_E and basic charge of 1 electronic charge. All other particles are chains, strings and rings made from the basic block

(There is evidence that the basic "Lego" block is the Quark's block not the electron's)

So the universe is much simpler then we think. And the number of different particles is much lower.

Step 1

The Electrical Equivalent circuit for Relativistic Mass And hidden parameters in Special Relativity

According to Special Relativity, elementary particles have a rest mass m_0. When the particle moves with a "slip" β it's mass m_T is growing according to

1.a] $$m_T = \frac{m_0}{\sqrt{1-\beta^2}}$$

Because of the square root in the equation, the "slip" β is limited to $-1 < \beta < 1$ which means that the particle velocity is always less then the speed of light

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Now I multiply both side of eq.1 by α

1.b] $$\alpha m_T = \frac{\alpha m_0}{\sqrt{1-\beta^2}}$$

Now I am going to make a brave change in eq. 1.b
The square of eq. 1.b is

2] $$\alpha^2 m_T^2 = \frac{\alpha^2 m_0^2}{1-\beta^2} = \frac{\alpha^2 m_0^2}{(1-\beta)(1+\beta)} = \frac{\alpha^2 m_0^2}{2} \cdot \left[\frac{1}{1-\beta} + \frac{1}{1+\beta}\right]$$

Eq.2 in contrary to eq.1, is a "continuous function" with only two "bad" points $\beta \neq \pm 1$
According to eq. 2 we can pass the speed of light,

Step 2

Deriving an Electrical Equivalent Circuit that helps understand Special Relativity

Let go back to eq. 2 and write it as follows

3] $$\alpha^2 m_T^2 = \alpha^2 m_-^2 + \alpha^2 m_+^2 = \frac{\alpha^2 m_0^2}{2} \cdot \left[\frac{1}{1-\beta} + \frac{1}{1+\beta}\right]$$

Now I divide the last equation into two parts that now on **must be treated separately**

4] $$\alpha^2 m_-^2 = \frac{\alpha^2 m_0^2}{2} \cdot \left[\frac{1}{1-\beta}\right]$$
$$\alpha^2 m_+^2 = \frac{\alpha^2 m_0^2}{2} \cdot \left[\frac{1}{1+\beta}\right]$$

The total relativistic mass is computed using Pythagoras

5] $$\alpha^2 m_T^2 = \alpha^2 m_-^2 + \alpha^2 m_+^2$$

I give two numeric examples. Pay attention to the second example, in which the mass velocity is higher then the speed of light $(\beta > 1)$
Suppose;

$m_0 = \sqrt{2}$ and $\beta = 0.8$ then,

$$m_-^2 = \frac{m_0^2}{2} \cdot \left[\frac{1}{1-\beta}\right] = \frac{2}{2} \cdot \left[\frac{1}{1-0.8}\right] = 5 \qquad m_+^2 = \frac{m_0^2}{2} \cdot \left[\frac{1}{1+\beta}\right] = \frac{2}{2} \cdot \left[\frac{1}{1+0.8}\right] = 0.555$$

$$m_T^2 = \frac{m_0^2}{2} \cdot \left[\frac{1}{1-\beta} + \frac{1}{1+\beta}\right] = 5 + 0.555 = 5.555$$

In the following example, If the mass velocity is higher then the speed of light, we get an astonishing result .The mass m_T is a complex number.

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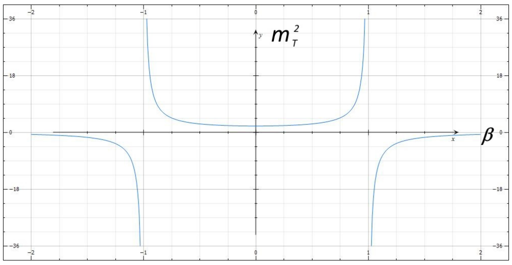
$m_0 = \sqrt{2}$ and $\beta = 1.4$ higher then the speed of light

$$m_-^2 = \frac{m_0^2}{2}\cdot\left[\frac{1}{1-\beta}\right] = \frac{2}{2}\cdot\left[\frac{1}{1-1.4}\right] = -2.5 \qquad m_+^2 = \frac{m_0^2}{2}\cdot\left[\frac{1}{1+\beta}\right] = \frac{2}{2}\cdot\left[\frac{1}{1+1.4}\right] = 0.416$$

$$m_T^2 = \frac{m_0^2}{2}\cdot\left[\frac{1}{1-\beta}+\frac{1}{1+\beta}\right] = -2.5 + 0.416 = -2.048$$

$m_T = \sqrt{-2.048} = j1.431 \quad \left(j = \sqrt{-1}\right)$ complex number mass

The following graph is for m_T^2 against β



Step 3

Making the equation a bit more physical

In eq.1 or eq. 2 we dont see any familiar physical phenomena. And the idea that speed of light is the same in all directions is not intuitive So, I am going to turn those equations into conventional not weird and intuitive physical equation that every student meets during his studies.

Let define

6]
$$j = \sqrt{-1}\ , \quad f_0 \text{ to be any frequency}\ , \quad \omega_0 = 2\pi f_0\ , \quad T_0 = \frac{1}{f_0}\ , \quad k_0 = \frac{2\pi}{\lambda_0}$$
$$\frac{1}{C_0} = \frac{\alpha^2 m_0^2}{2}\ , \quad \frac{1}{C_-} = \alpha^2 m_-^2\ , \quad \frac{1}{C_+} = \alpha^2 m_+^2\ , \quad \frac{1}{C_T} = \alpha^2 m_T^2$$

Now let substitute those definitions in eq. 4, (each equation is divide by $j\omega_0$)

And I define some new terms such as: Z_0 , Z_- , Z_+, Z_T and put them in eq. 3 and eq. 4

7]
$$\alpha^2 m_-^2 = \frac{\alpha^2 m_0^2}{2}\cdot\left[\frac{1}{1-\beta}\right]$$
$$Z_- = \frac{\alpha^2 m_-^2}{j\omega_0} = \frac{1}{j\omega_0 C_-} = \frac{1}{j\omega_0\left(1-\beta\right)}\cdot\frac{\alpha^2 m_0^2}{2} = \frac{1}{j\omega_0\left(1-\beta\right)C_0}$$
$$\alpha^2 m_+^2 = \frac{\alpha^2 m_0^2}{2}\cdot\left[\frac{1}{1+\beta}\right]$$
$$Z_+ = \frac{\alpha^2 m_-^2}{j\omega_0} = \frac{1}{j\omega_0 C_+} = \frac{1}{j\omega_0\left(1+\beta\right)}\cdot\frac{\alpha^2 m_0^2}{2} = \frac{1}{j\omega_0\left(1+\beta\right)C_0}$$

What we get is something more familiar to electrical engineers

8]
$$\alpha^2 m_T^2 = \alpha^2 m_-^2 + \alpha^2 m_+^2 = \frac{\alpha^2 m_0^2}{2}\cdot\left[\frac{1}{1-\beta}+\frac{1}{1+\beta}\right]$$
$$Z_T = Z_+ + Z_+ = \frac{\alpha^2 m_T^2}{j\omega_0} = \frac{\alpha^2 m_-^2}{j\omega_0} + \frac{\alpha^2 m_-^2}{j\omega_0}$$
$$Z_T = Z_+ + Z_+ = \frac{1}{j\omega_0 C_T} = \frac{1}{j\omega_0 C_-} + \frac{1}{j\omega_0 C_+} = \frac{1}{j\omega_0(1-\beta)C_0} + \frac{1}{j\omega_0(1+\beta)C_0}$$

Every electrical engineer will say that $C_T, C_-, C_+, \mathrm{C}_0$ are electrical capacitors.
And it is well known that the alternating current (AC) impedance of a capacitor is:

9]
$$Z = \frac{1}{j\omega C}$$

Before continuing with the explanation, let solve one more example

Milliken Experiment

In 1909 Robert A. Milliken and Harvey Fletcher performed an oil drop experiment to measure the elementary electric charge of the electron
Today we know that for the electron or positron

$m_0 = 9.109\cdot 10^{-31}$ kg $= 0.511 MeV$

and the electron charge is

$Q_E = -1.602\cdot 10^{-19}$ Coloumb

We know from electricity that **charge equal capacity time voltage**

Using $Q_E = C_E \cdot V_E$ and $\frac{1}{C_0} = \frac{\alpha^2 m_0^2}{2}$

We can define a new kind of voltage that we will call **"Rest Mass Voltage"** V_{m_0}
Since

$$Q_E = C_0 \cdot V_{m_0}$$

$$V_{m_0} = \frac{Q_E}{C_0} = Q_E \cdot \frac{\alpha^2 m_0^2}{2} = \alpha^2 \frac{1.602 \cdot 10^{-19} \cdot (9.109 \cdot 10^{-31})^2}{2} = \alpha^2 \bullet 6.64 \cdot 10^{-80} \text{ Coloumb} \cdot \text{kg}^2$$

The same procedure can be used to find the "Rest Mass Voltage" for other charged elementary particles such as Protons and quarks
(Pay attention to the physical units)

Particles that have no charge are composed from charged particle with opposite charges.

The neutron for example, is a positive proton plus a negative electron (old model) or charged quarks (new model).

Let see now if the experiment at LHC (Large Hardon Collider) are made properly. In all colliders, elementary particles such as protons electrons and so on, make collisions near the speed of light therefore; $\beta < 1$ but $\beta \approx 1$,
The part of the equation that is responsible to mass grow is

$$m_T^2 = \frac{m_0^2}{1-\beta^2} \approx m_-^2 = \frac{m_0^2}{2} \cdot \left[\frac{1}{1-\beta}\right] \quad \text{because} \quad \frac{1}{1+\beta} \approx \frac{1}{2} \quad , \; m_+^2 = \frac{m_0^2}{2} \cdot \left[\frac{1}{1-\beta}\right] = \frac{m_0^2}{4}$$

Step 5

Now I am going to explain why the speed of light is the same in any direction

From eq. 8

10] $$Z_T = Z_- + Z_+$$

Suppose the current that flow through the series of impedances is I
[11]

$$V_- + V_+ = Z_- I_- + Z_+ I_+ = \frac{1}{j\omega_0 C_-} I_- + \frac{1}{j\omega_0 C_+} I_+ = \frac{1}{j\omega_0 (1-\beta) C_0} I_- + \frac{1}{j\omega_0 (1+\beta) C_0} I_+$$

The question is how the current depended on frequency?.
To find the answer we must remember that for a capacitor

12] $$i = C\frac{dv}{dt}$$

In the case of AC Let use those definitions in eq. 11

13] $$I_0 = Ie^{j\omega_0 t} \qquad I_- = Ie^{j\omega_0 (1-\beta)t} \qquad I_+ = Ie^{j\omega_0 (1+\beta)t}$$

And from eq. 11

14] $$V_- + V_+ = \frac{1}{j\omega_0 (1-\beta) C_0} Ie^{j(\omega_0 (1-\beta)t)} + \frac{1}{j\omega_0 (1+\beta) C_0} Ie^{j(\omega_0 (1+\beta)t)}$$

The reason for that is that the frequency of the current and voltage must be the same and the same frequency must also appear in the impedance of the capacitor

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15]

$$V_- = Z_- \cdot I_- = \frac{1}{j\omega_0 (1-\beta) C_0} I e^{j(\omega_0 (1-\beta)t)}$$

$$V_+ = Z_+ \cdot I_+ = \frac{1}{j\omega_0 (1+\beta) C_0} I e^{j(\omega_0 (1+\beta)t)}$$

The conclusion is that when the mass is moving and $\beta \neq 0$ we have two frequencies

So

16] $$V_T = V_- + V_+$$

Is a superposition of two different voltages with different frequencies and amplitudes?

Such a phenomena described above occur in "wave guides", "transmission lines", and "cavities".

Conclusion: we live in a 3D electromagnetic cavity, only electromagnetic waves and charges are responsible for electric currents. Capacitance and mass are passive elements.

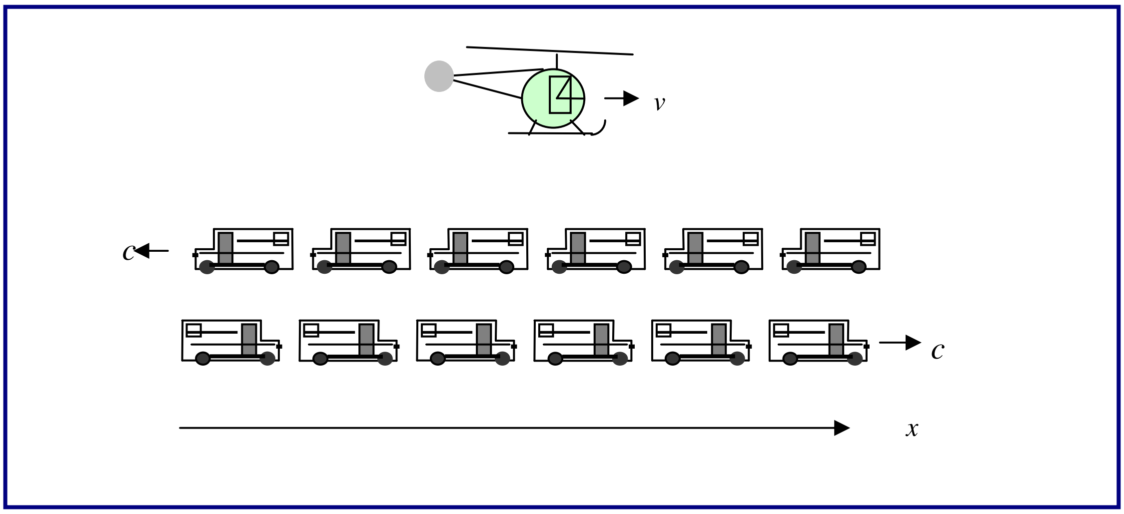
Step 6

A short introduction to Transmission lines

To understand what happens in a "transmission line" let exam;

Relative Galilean Movement

Suppose a chopper fly above a highway. If the chopper velocity is v to the right, the pilot claim that the velocity of the cars moving to the right is $c-v$ and cars moving to the left are at a higher velocity $c+v$. Choppers can move faster then cars. If $v > c$, the pilot observe that all the cars move to the left.



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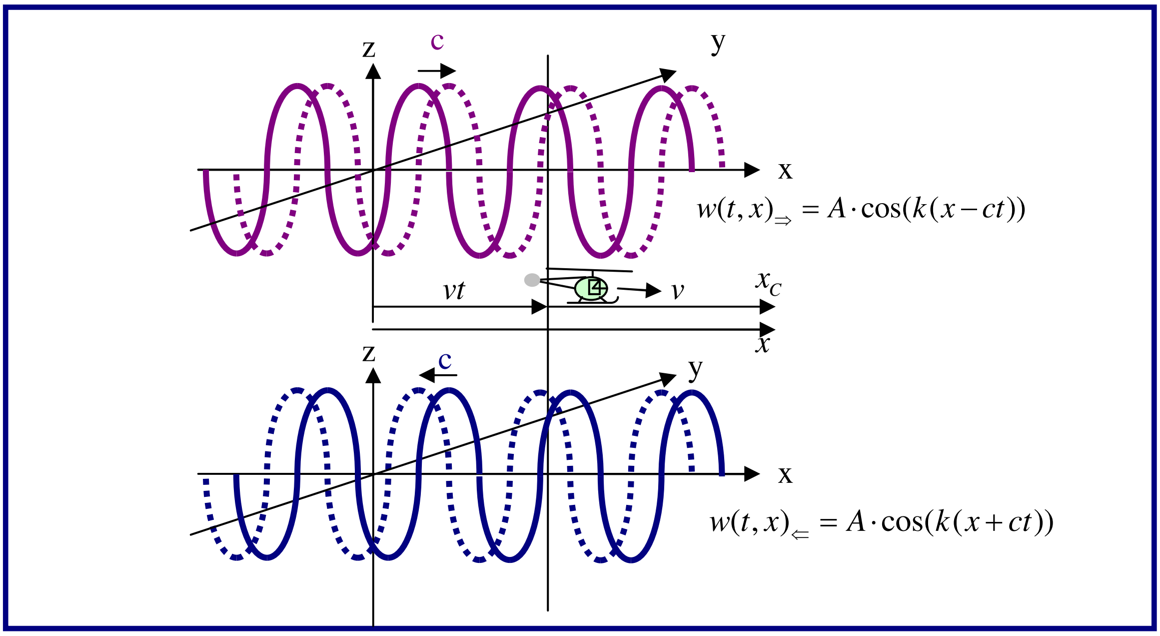
Step 7

Wave Moving in Opposite Directions
and
Standing Waves
(Chopper and Vehicles describe mathematically)



The following equation

$$w(t,x)_{\Rightarrow} = A\cdot\cos(k(x-ct))$$

Describe a cosine wave moving along the x direction from left to right
While

$$w(t,x)_{\Leftarrow} = A\cdot\cos(k(x+ct))$$

Describe a wave moving in the opposite direction from right to left

In order to find the wave direction, we know that $\cos(\varphi)=1$ when $\varphi=0$
So for the wave moving along the positive x direction
$w(t,x)_{\Rightarrow} = A\cdot\cos(k(x-ct))$ $\quad \varphi=0$ means $x-ct=0$ or $x=ct$
For the wave moving along the negative x direction
$w(t,x)_{\Leftarrow} = A\cdot\cos(k(x+ct))$ $\quad \varphi=0$ means $x+ct=0$ or $x=-ct$

A standing wave is a wave in which its amplitude is formed by the superposition of two waves of the same frequency propagating in opposite directions.

$$w(t,x) = w(t,x)_{\Rightarrow} + w(t,x)_{\Leftarrow}$$

$$w(t,x) = A\cdot\cos(k(x-ct)) + A\cdot\cos(k(x+ct)) = 2A\cos(kx)\cos(kct) = 2A\cos(kx)\cos(\omega t)$$

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Step 8

Waves under Galileans Transformation

Now, suppose that an observer O_C (the pilot of the chopper) is moving with velocity v in the positive direction of x. his position relative to the x axis is given by (look again on the picture above)

$$x = x_C + vt$$

The moving observer O_C will see the cosine wave as follow

$$w_v(t,x)_{\Rightarrow} = A\cdot\cos(kx - ct)) = A\cdot\cos(k(x_C + vt) - ct)) = A\cdot\cos(kx_C - k(c-v)t))$$
$$w_v(t,x)_{\Leftarrow} = A\cdot\cos(kx + ct)) = A\cdot\cos(k(x_C + vt) + ct)) = A\cdot\cos(kx_C + k(c+v)t))$$

Now, if $c = \dfrac{\omega_0}{k}$ and $\beta = \dfrac{v}{c}$ we can write the above equation from the point of view of the observer, as follow;

$$w_v(t,x_C)_{\Rightarrow} = A\cdot\cos(kx_C - k(c-v)t)) = A\cdot\cos(kx_C - kc(1-\frac{v}{c})t)) = A\cdot\cos(kx_C - \omega_0(1-\beta)t))$$
$$w_v(t,x_C)_{\Leftarrow} = A\cdot\cos(kx_C + k(c+v)t)) = A\cdot\cos(kx_C + kc(1+\frac{v}{c})t)) = A\cdot\cos(kx_C + \omega_0(1+\beta)t))$$

The moving observer sees two waves with different frequencies

The standing wave is the sum of the waves that move to the right and to the left

$$w(t,x_C) = w(t,x_C)_{\Rightarrow} + w(t,x_C)_{\Leftarrow}$$
$$w(t,x_C) = A\cdot\cos(kx_C - \omega_0(1-\beta)t)) + A\cdot\cos(kx_C + \omega_0(1+\beta)t))$$
$$w(t,x_C) = A\cdot\cos(kx_C - \omega_0 t + \omega_0\beta t) + A\cdot\cos(kx_C + \omega_0 t + \omega_0\beta t) = 2A\cos(kx_C + \omega_0\beta t)\cos(\omega_0 t)$$
$$w(t,x_C) = 2A\cos(kx_C + kc\beta t)\cos(\omega_0 t) = 2A\cos(kx_C + kvt)\cos(\omega_0 t) = 2A\cos(k(x_C + vt)\cos(\omega_0 t)$$

But,

$$x = x_C + vt$$

Therefore,

$$w(t,x_C) = 2A\cos(k(x_C + vt)\cos(\omega_0 t) = 2A\cos(kx)\cos(\omega_0 t) = w(t,x)$$

What we see is that the observer moves to the right, from his point of view. The standing wave exists and moves to the left because

$$x = x_C + vt = 0 \qquad \Rightarrow \qquad x_C = -vt$$

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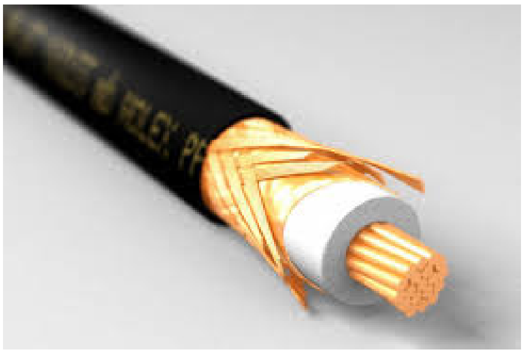
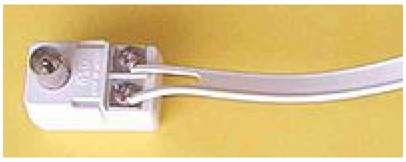
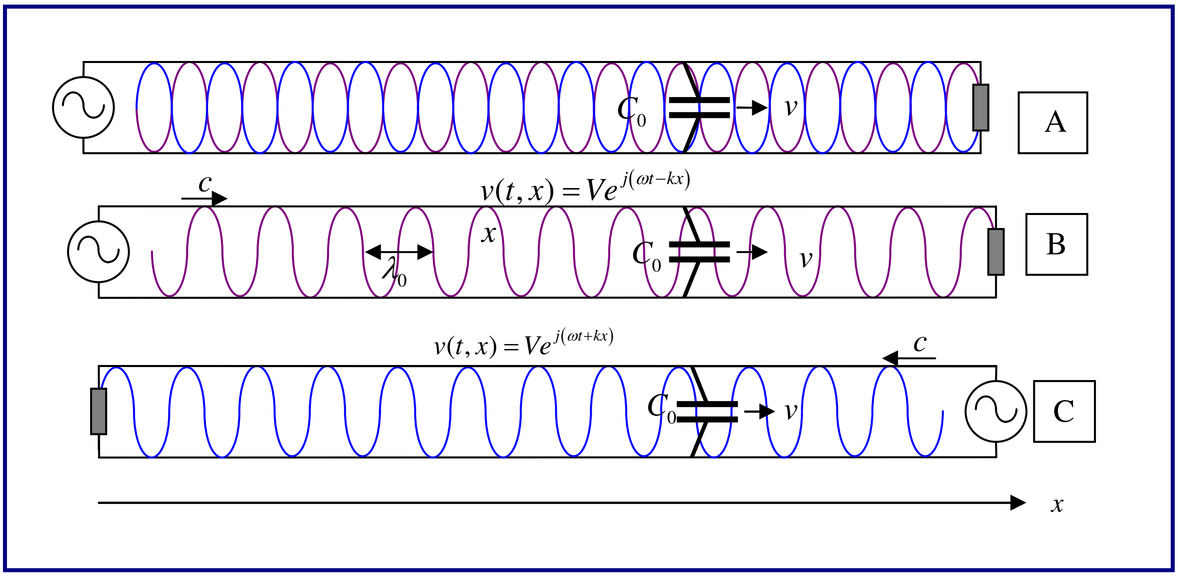
The transmission line model of Relativity



Coaxial cables are transmission lines, used to transmit electrical information at very high frequencies in Cable TV and Internet
The simplest transmission line is Twin-lead is a form of parallel-wire balanced transmission line. The separation between the two wires in twin-lead is small compared to the wavelength of the radio frequency (RF) signal carried on the wire.



I use the twin lead transmission line to explain S.R



In the picture above (picture A) a transmission line is connected to a sinusoidal voltage source. the transmission line is terminated with an adequate resistor . and a standing wave is created along the transmission line. It was proved that a standing wave is a superposition of two waves moving in opposite directions, each wave with velocity c. So instead of one Transmission-line I use two. One for the wave going

from left to right, (picture B). and one, for the wave going from right to left. (picture C)
Now I connect a capacitor C_0 to the transmission line. In such a way, that the capacitor can slide along the transmission line.
The capacitor connected to the transmission line change the distribution of current and voltage along the whole transmission line (every star or elementary particle disturbs the entire Universe) the capacitor can move to the right with velocity v while keeping an electrical connection with the transmission line (see picture B and C). The capacitor is the observer O_C (the pilot of the chopper)
When the capacitor C_0 which describe rest mass in the S.R model $\left[\frac{1}{C_0}=\frac{\alpha^2 m_0^2}{2}\right]$ move to the right the impedances Z_- and Z_+ change as was explained above. The current in each capacitor is given by

$$I_0=\frac{V_0}{Z_0}=\frac{Ve^{j(\omega_0 t)}}{\frac{1}{j\omega_0 C_0}}$$

$$I_-=\frac{V_-}{Z_-}=\frac{Ve^{j(\omega_0(1-\beta)t)}}{\frac{1}{j\omega_0(1-\beta)C_0}} \qquad I_+=\frac{V_+}{Z_+}=\frac{Ve^{j(\omega_0(1+\beta)t)}}{\frac{1}{j\omega_0(1+\beta)C_0}}$$

This current through the sliding capacitor C_0 change the voltage and current in every point along the transmission line. A transmission line without any disturbance is a homogeneous transmission line. When the capacitor C_0 is added or changed from one value to a greater value all the voltages and current change but the change goes through the transmission line at the speed of light or less so if two black holes collide (each black hole is represented by a capacitors the first black hole is represented by C_{01} the second by C_{02} . their movement change the current and voltage along the entire transmission line and LIGO catch the event after some millions of years, because information on a transmission line goes a bit "slowly"
In the case of electron positron annihilation the electron represented by C_{01} and the positron by C_{02} are annihilated and the mass vanish, what we get is a 2γ ray. In this case, a transmission line that was disturbed by two particles and then the disturbance disappeared.
Mathematically, we have to pay attention to the fact that when the mass don't move the current is only

$$I_0=\frac{Ve^{j(\omega_0 t)}}{\frac{1}{j\omega_0 C_0}}$$

And when the mass moves the current is a superposition of two currents

$$I = I_- + I_+ = \frac{Ve^{j(\omega_0(1-\beta)t)}}{\frac{1}{j\omega_0(1-\beta)C_0}} + \frac{Ve^{j(\omega_0(1+\beta)t)}}{\frac{1}{j\omega_0(1+\beta)C_0}}$$

At the speed of light $(\beta = 1)$ $I_- = 0$ and $I_+ = 2I_0$

What make mass to move

The amplitude of V_0, V_-, V_+ in the transmission line, are the same, so it is easy to show that

$$I_0 \le I_- + I_+$$

In electricity the power is given by

$$S = P + jQ = V \cdot I^*$$

So we can compute the Power deliverd to the capacitors

$S_0 = jQ_0 = V_0 \cdot I_0^*$

$S = S_- + S_+ = jQ_- + jQ_+ = V_- \cdot I_-^* + V_+ \cdot I_+^*$

But $S_0 < S_- + S_+$ so mass may prefer not to move (the law that a system prefer to have minimum energy)

According to the rules of electricity, the capacitor is a passive element the capacitor power is Reactive (jQ) the capacitor store energy taken from the "Transmission line".

If the velocity is higher then the speed of light. The capacitance turns into resistance. The current through it appears as heat.

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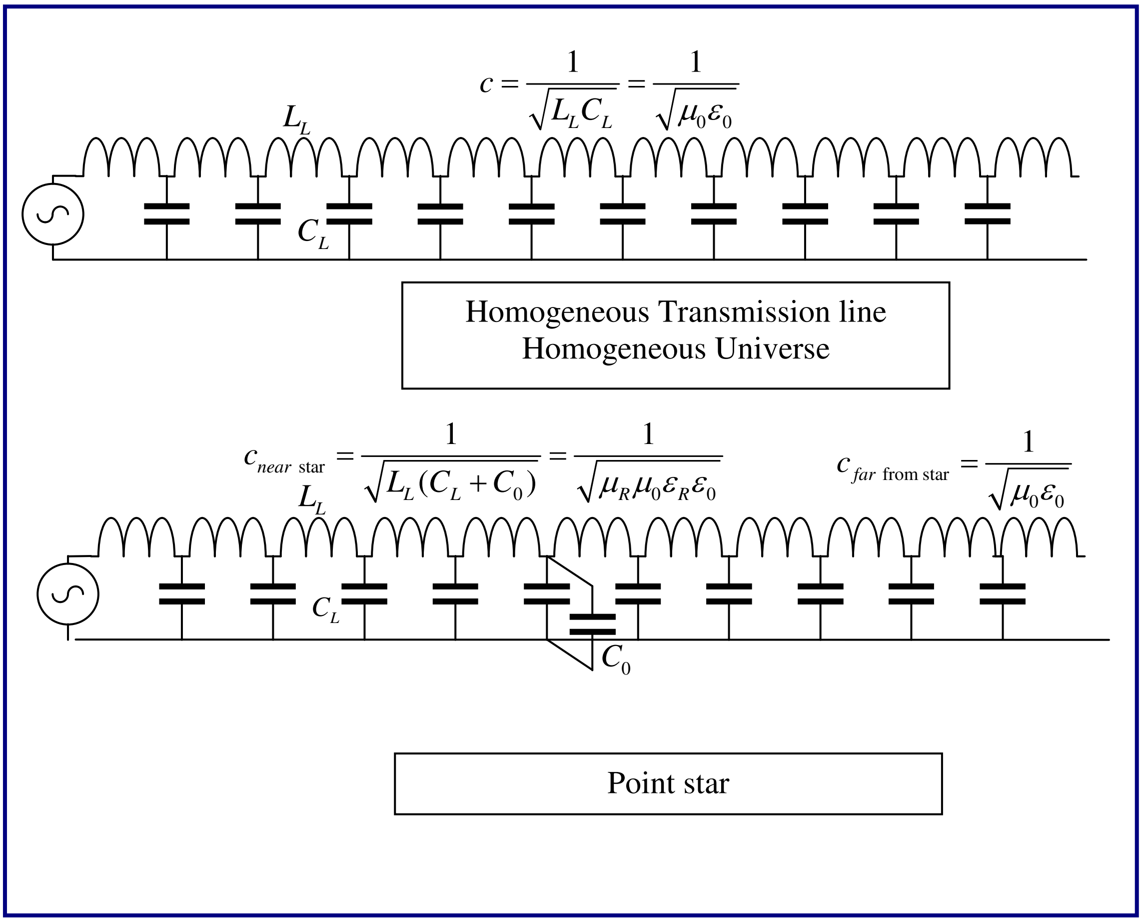
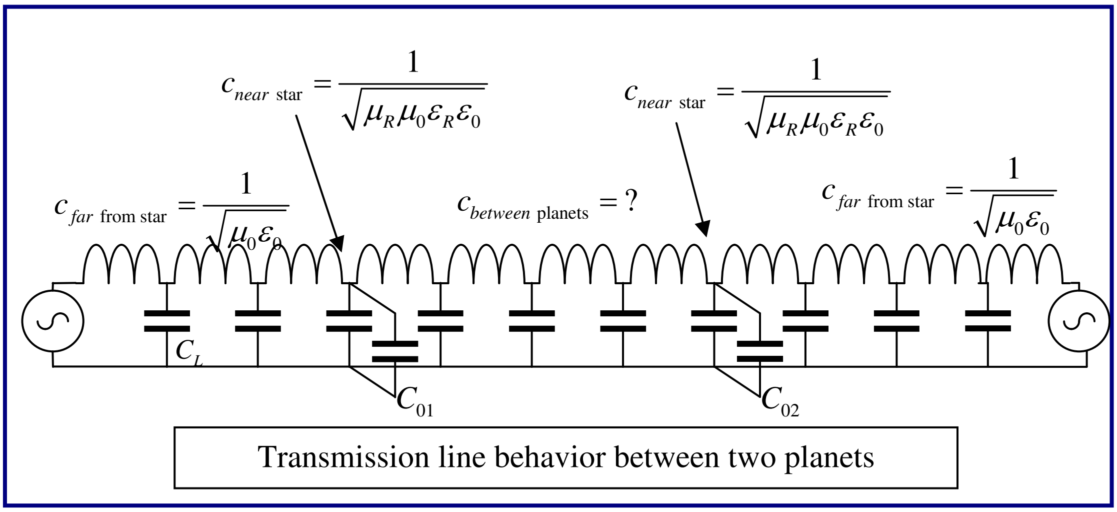
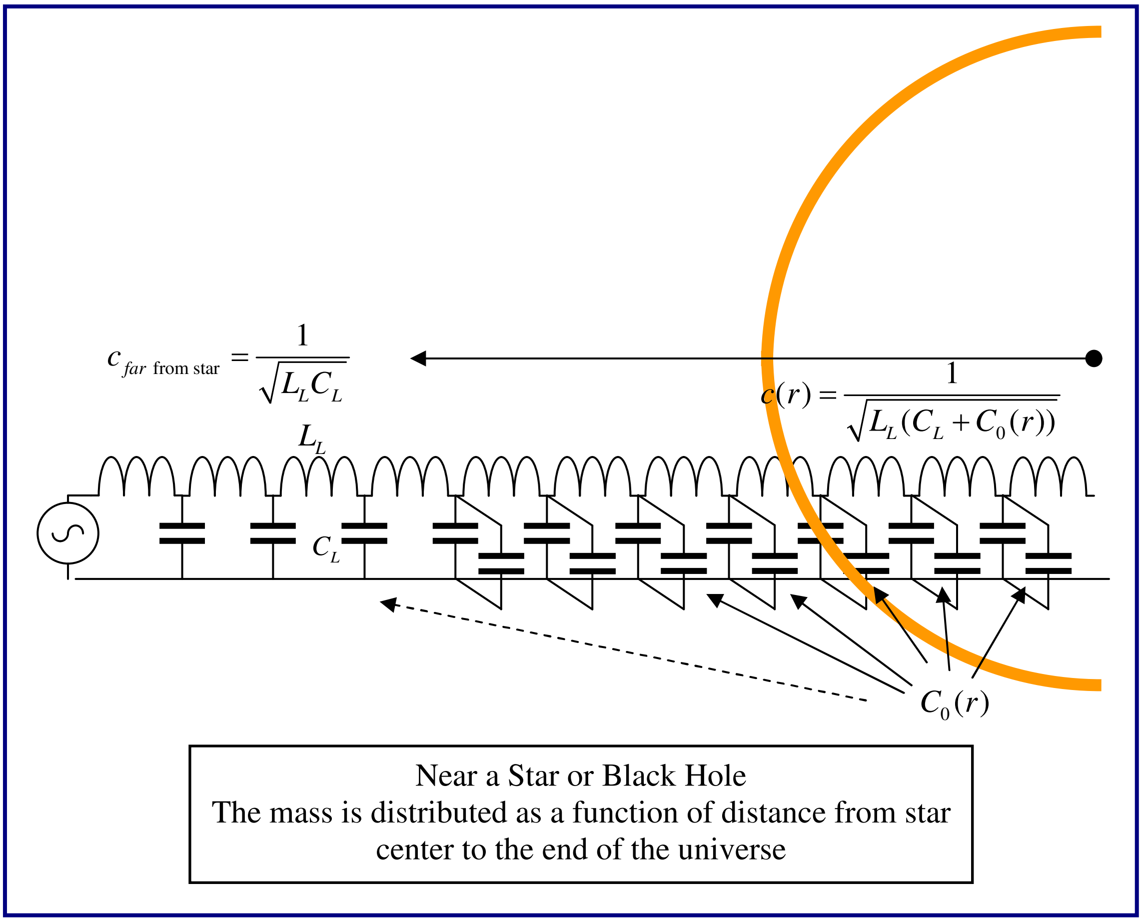
Examples


$c = \frac{1}{\sqrt{L_L C_L}} = \frac{1}{\sqrt{\mu_0 \varepsilon_0}}$
L_L
C_L
Homogeneous Transmission line
Homogeneous Universe
$c_{near\ \mathrm{star}} = \frac{1}{\sqrt{L_L(C_L + C_0)}} = \frac{1}{\sqrt{\mu_R \mu_0 \varepsilon_R \varepsilon_0}}$
$c_{far\ \mathrm{from\ star}} = \frac{1}{\sqrt{\mu_0 \varepsilon_0}}$
L_L
C_L
C_0
Point star


$c_{near\ \mathrm{star}} = \frac{1}{\sqrt{\mu_R \mu_0 \varepsilon_R \varepsilon_0}}$
$c_{near\ \mathrm{star}} = \frac{1}{\sqrt{\mu_R \mu_0 \varepsilon_R \varepsilon_0}}$
$c_{far\ \mathrm{from\ star}} = \frac{1}{\sqrt{\mu_0 \varepsilon_0}}$
$c_{between\ \mathrm{planets}} = ?$
$c_{far\ \mathrm{from\ star}} = \frac{1}{\sqrt{\mu_0 \varepsilon_0}}$
C_L
C_{01}
C_{02}
Transmission line behavior between two planets



Conclusions

1. Electron charge stay on a capacitor, the capacitor has mass, mass and capacitors are passive element and can't transmit gravitation waves. We can notice only when mass move and make the "Transmission Line" voltages and currents to change value.
2. The " Transmission Line" including mass distribution is what we call "Space time"
3. Mass becomes complex at velocity higher then the speed of light
4. Universe in one dimension behave like a transmission line, in three dimensions the universe behave as a spherical cavity , all the stars and galaxies are in that cavity.
5. Our universe is almost empty so it is almost homogenous.
6. No such thing: There are four conventionally accepted fundamental interactions—gravitational, electromagnetic, strong nuclear, and weak nuclear. May be all elementary particles are chains, strings and rings of electrons.
7. Since the speed of light is the same for all this forces. They behave according to the same rules Therefore the universe is simpler than we think

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8.

Appendix

The analysis of Time Dilation, Length Contraction and Lorentz Transformation are similar to mass change. Because all the equation look the same.

The analysis of time dilation is similar to the analysis of mass change

$$\tau_T = \frac{\tau_0}{\sqrt{1-\beta^2}} \qquad \text{and} \qquad m_T = \frac{m_0}{\sqrt{1-\beta^2}}$$

The analysis of length contraction is similar to the analysis of mass change because they look the same.

$$\lambda_0 = \frac{\lambda_T}{\sqrt{1-\beta^2}} \qquad \text{and} \qquad m_T = \frac{m_0}{\sqrt{1-\beta^2}}$$

and

Lorentz boost Transformation (x direction)

$$ct' = \frac{ct-\beta x}{\sqrt{1-\beta^2}} \qquad \text{similar to} \qquad m' = \frac{m_1 - m_2}{\sqrt{1-\beta^2}}$$

$$x' = \frac{x-vt}{\sqrt{1-\beta^2}} \qquad \text{similar to} \qquad m' = \frac{m_1 - m_2}{\sqrt{1-\beta^2}}$$

$$y' = y$$

$$z' = z$$

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