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Special Relativity Entirely New Explanation

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Introduction

In this paper I correct a minor error in Einstein's theory of Special Relativity, and suggest a new approach to tackle problems in this area of physics. Propose of this paper is to understand what is mass. I suggest, to read this paper carefully because the minor error is in the foundation of physics. And a little part of the big structure that was built on those foundations is going to crash.

Definitions

m_0 , m_T	Rest mass and moving mass
c	speed of light
v	mass velocity relative to the lab
$\beta = \frac{v}{c}$	slip
L_X	Inductance

According to Special Relativity, when a particle with rest mass m_0 (energy) moves, its energy (mass) m_T is growing according to

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

If both side of Eq. 1 are multiplied by a constant α and squared, and then the result is divided by $j\omega_0$ we get an equation that still obey Einstein's Eq. 1 but look different.

2] $$\frac{\alpha^2 m_T^2}{j\omega_0} = \frac{1}{j\omega_0}\cdot\frac{\alpha^2 m_0^2}{1-\beta^2} = \frac{\alpha^2 m_-^2}{j\omega_0} + \frac{\alpha^2 m_+^2}{j\omega_0} = \frac{1}{j\omega_0}\frac{\alpha^2 m_0^2}{2}\cdot\left[\frac{1}{1-\beta}+\frac{1}{1+\beta}\right]$$

let define

3] $$\frac{1}{L_0} = \frac{\alpha^2 m_0^2}{2} \quad , \quad \frac{1}{L_-} = \alpha^2 m_-^2 \quad , \quad \frac{1}{L_+} = \alpha^2 m_+^2 \quad , \quad \frac{1}{L_T} = \alpha^2 m_T^2$$

Eq 2 is combined with the definitions in Eq. 3

4] $$\frac{1}{j\omega_0 L_T} = \frac{1}{j\omega_0 L_-} + \frac{1}{j\omega_0 L_+} = \frac{1}{j\omega_0(1-\beta)L_0} + \frac{1}{j\omega_0(1+\beta)L_0}$$

From 3 it is well understood that

5] $$\frac{1}{j\omega_0 L_-} = \frac{1}{j\omega_0(1-\beta)L_0}$$
$$\frac{1}{j\omega_0 L_+} = \frac{1}{j\omega_0(1+\beta)L_0}$$

It is claimed that Eq 4 contain an error according to the laws of Electricity

The inductors impedances is derived from Eq. 5 as follows

6] $$\begin{aligned} Z_0 &= j\omega_0 L_0 \\ Z_- &= j\omega_0 L_- = j\omega_0(1-\beta)L_0 \\ Z_+ &= j\omega_0 L_+ = j\omega_0(1+\beta)L_0 \\ Z_T &= j\omega_0 L_T \end{aligned}$$

Voltages and currents must obey Ohm's law for alternating current, so;

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7]

$$I_0 = \frac{V_0}{Z_0} = \frac{V_0}{j\omega_0 L_0} = \frac{Ve^{j(\omega_0 t)}}{j\omega_0 L_0}$$

$$I_- = \frac{V_-}{Z_-} = \frac{V_-}{j\omega_0 L_-} = \frac{V_-}{j\omega_0(1-\beta)L_0} = \frac{Ve^{j(\omega_0(1-\beta)t)}_-}{j\omega_0(1-\beta)L_0}$$

$$I_+ = \frac{V_+}{Z_+} = \frac{V_+}{j\omega_0 L_+} = \frac{V_+}{j\omega_0(1+\beta)L_0} = \frac{Ve^{j(\omega_0(1+\beta)t)}}{j\omega_0(1+\beta)L_0}$$

If we combine Eq. 7 with the wrong Eq. 4 we get the physically correct equation and eliminate Einstein mistake

8]

$$I_T = I_- + I_+ = \frac{V_-}{Z_-} + \frac{V_+}{Z_+} = \frac{V_-}{j\omega_0 L_-} + \frac{V_+}{j\omega_0 L_+} = \frac{Ve^{j(\omega_0(1-\beta)t)}}{j\omega_0(1-\beta)L_0} + \frac{Ve^{j(\omega_0(1+\beta)t)}}{j\omega_0(1+\beta)L_0}$$

Eq 8 enable us to compute also the power in each impedance.

According to Alternating Current rules (for effective voltage and current) the complex power is given by

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

Therefore

10]

$$S_T = S_- + S_+ = jQ_T = jQ_- + jQ_+ = V_- \cdot I_-^* + V_+ \cdot I_+^*$$
$$S_0 = jQ_0 = V_0 \cdot I_0^*$$

Minimum power occurs when $\beta = 0$ because

11] $$S_0 < S_- + S_+$$

So

The electrical circuit in the following picture describe Special Relativity behavior for a single mass

Till now we thought that mass is "particles mass or gravitation", a separate area in physic but now on "mass" is something that behave like "inductance" which means that Special Relativity is an electromagnetic phenomena.

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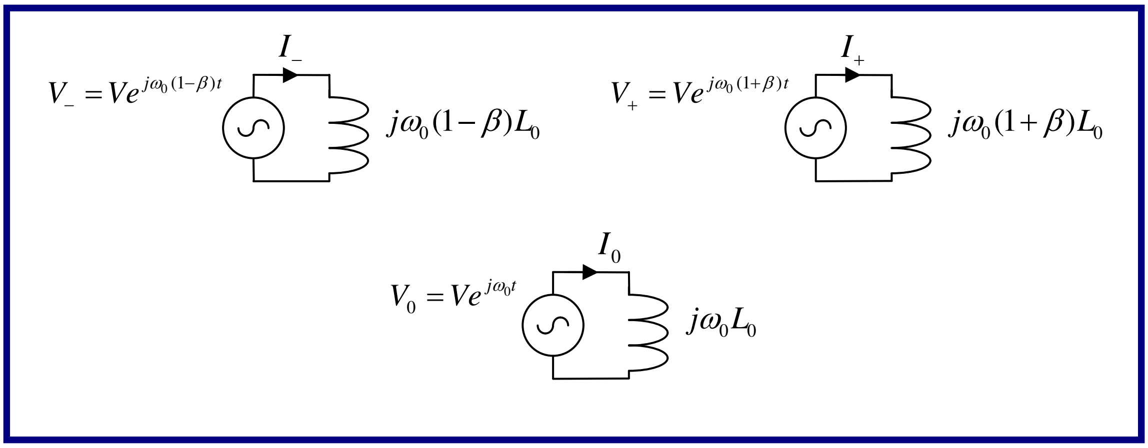
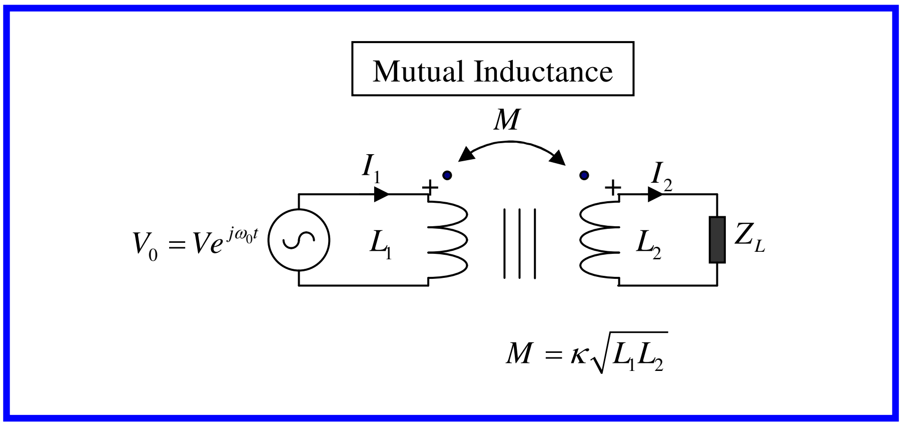


Such a phenomena described above occur in "wave guides", "transmission lines", and "cavities".

In the last section of that paper I will explain a bit more the electric circuit in the picture and explain why the universe is a cavity. Inside that cavity all the waves move with the same velocity c in any direction (Einstein assumption). And produce standing waves. When the mass try to move through a standing wave we get Special Relativity (explained in the last part of that paper)

Mutual Inductance And Newton's theory of gravitation

Mutual inductance occurs when the change in current in one inductor induces a voltage in another nearby inductor. It is important as the mechanism by which transformers work, but now I am going to show that gravitation is mutual inductance between planets stars and galaxies



According to Newton's theory of gravitation

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$$F = G\frac{m_1 m_2}{r^2}$$

and from Eq. 3 far above

$$m_1 = \frac{\sqrt{2}}{\alpha\sqrt{L_1}} \qquad m_2 = \frac{\sqrt{2}}{\alpha\sqrt{L_2}}$$

So the Newton force between two slow moving stars is

$$F = G\frac{2}{r^2\alpha^2\sqrt{L_1 L_2}}$$

if we define the mutual inductance of two planets to be

$$\hat{M}_{1,2} = \frac{\alpha^2\sqrt{L_1 L_2}}{2G}$$

Then

$$F \cdot \hat{M}_{1,2} = \frac{1}{r^2}$$

this is only an example how to use mutual induction in planetary motion. The process can be applied to Schwarzschild radius and black holes if the terms with β are taking into account the problem will be solved with relativity.

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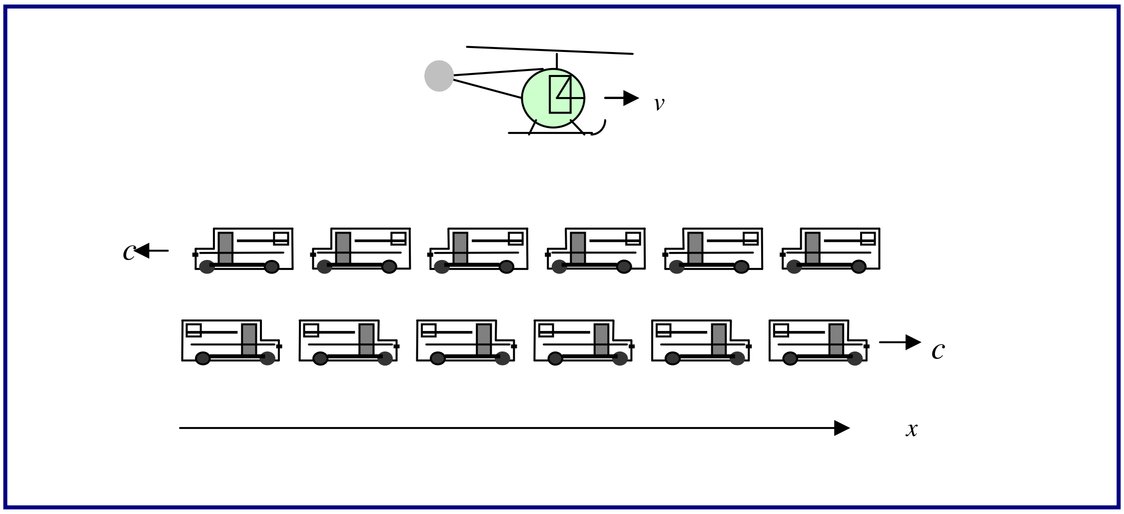
The universe as a one big cavity

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 $c+v$.



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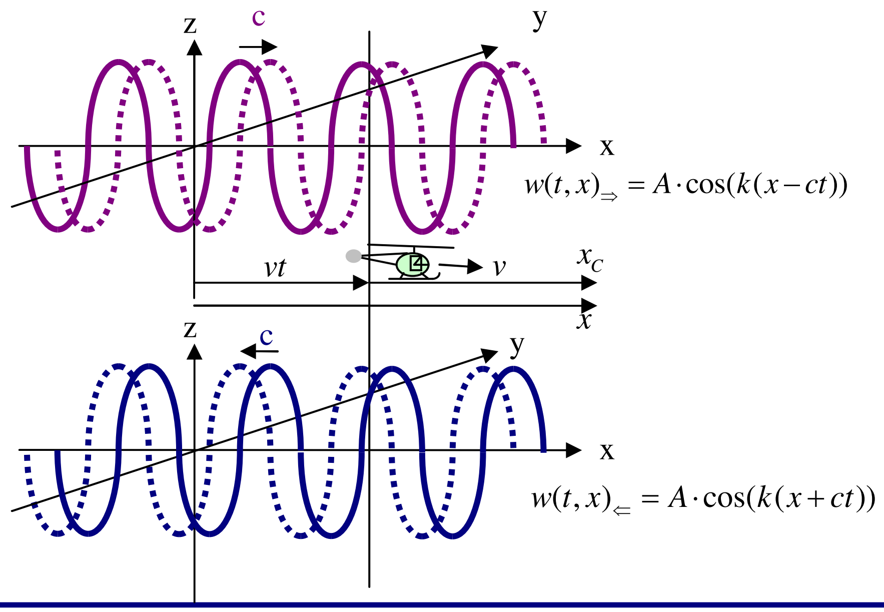
Wave Moving in Opposite Directions
and
Standing Waves
(Chopper and Vehicles describe mathematically)



The following equation

$$w(t,x)_{\Rightarrow} = A\cdot\cos(k(x-ct)) = \mathrm{Re}\,al(Ae^{j(k(x-ct))})$$

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

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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 $x=-ct$

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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.

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

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

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 observer sees another frequency $\omega = \omega_0\left(1 \pm \beta\right)$

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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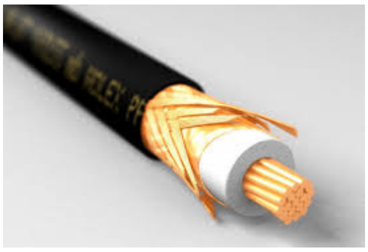
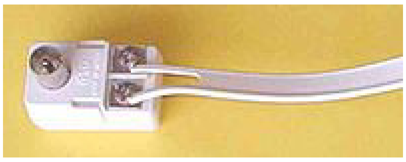
The transmission line model of Special Relativity



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.



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

In the picture below (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 an Inductor L_0 to the transmission line In such a way that the inductor can slide along the transmission line.
The inductor can move to the right with velocity v while keeping an electrical connection with the transmission line (see picture B and C). The inductor is the observer O_C (the pilot of the chopper)
When the inductor L_0 which describe rest mass in the S.R model does not move the voltage on its terminal is in picture B is $Ve^{j(\omega_0 t-kx)}$ and when the inductor move to the right

$x = x_C + vt$ So $Ve^{j(\omega_0 t-k(x_C+vt))} = Ve^{j(\omega_0 t-kvt-kx_C)} = Ve^{j(\omega_0(1-\beta)t-kx_C)}$ and the net voltage on The inductor terminals is $Ve^{j\omega_0(1-\beta)t}$

In picture B and C the inductors move in the same direction the inductors are connected with the green line and represent one mass.
But in picture C the wave move in the opposite direction $x = x_C + vt$ so

$Ve^{j(\omega_0 t+k(x_C+vt))} = Ve^{j(\omega_0 t+kvt+kx_C)} = Ve^{j(\omega_0(1+\beta)t+kx_C)}$ And the net voltage on the inductor terminals is $Ve^{j\omega_0(1+\beta)t}$

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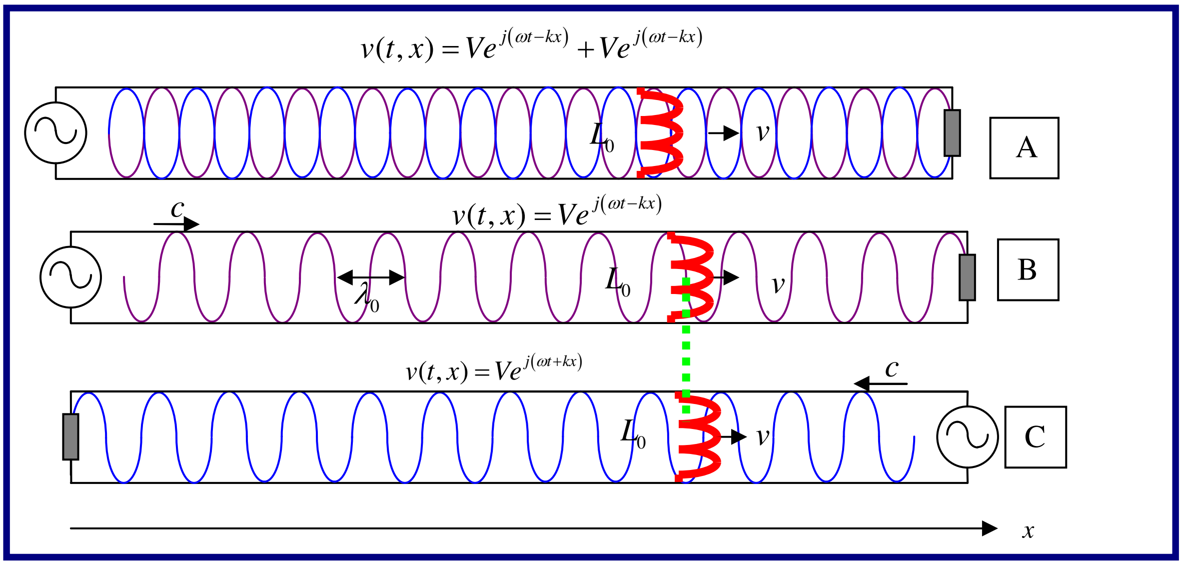

our universe is a spherical cavity with an alternating homogenous field $v(t,x) = Ve^{j(\omega t - kx)} + Ve^{j(\omega t - kx)}$ that move in any direction With many frequencies and the masses (particles planets and galaxies) move in that field as described in this paper and what we measure is a behavior according to special Relativity

Conclusions

1. The " Transmission Line" is what we call "Space time"
2. One dimension Universe behave like a transmission line, in three dimensions the universe behave like a spherical cavity , all the stars and galaxies are in that cavity.
3. Our universe is almost empty so it is almost homogenous.
4. For example, In Quantum Mechanics Perturbation theory we solve perturbation in a box. Planets, galaxies etc are perturbation in the universe cavity. So Quantum Mechanics and Relativity are similar theories.

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