The Absolute Time Theory

The Special Theory of Relativity Without Preconceived

Chapter 1

An unexpected discovery about the time dilation

Giacomo Roccaforte

Email: giacomo.roccaforte@solarmaker.it
Ceriale (SV), Italy
Mobile: +39 348 5252035

ABSTRACT

The "Absolute Time Theory" is the natural result of the analysis of specific situations that the Special Theory of Relativity does not take in consideration, or for which it does not provided information about them.

These situations are listed as critical points, scenarios that would lead to ambiguous, contradictory or unexplained conclusions, using the same principles as the theory itself.

Using the same experimental data as the basis for the birth of the Special Theory of Relativity, and which are normally used to confirm the theory itself, we comes to a solution where these critical points would be eliminated.

We then come to a theory where the results would be unambiguous, not dependent by arbitrary choice, in line with data experiences and established theory principles, such as the constancy of the speed of light and its independence from the motion of the source , means the same elements that are in Special Theory of Relativity, but interpreted in a different way.

The entire theory is now divided into chapters and translate in English in order to be more clear and readable.

Each chapter can be a theory itself or unexplained scenario, all of them with their conclusion, till to arrive to the final conclusion that means the final theory.

The following first chapter is the analysis of the same experimental data used for the basis for the birth of the Special Theory of Relativity, the Michelson/Morley experiment.

Introduction

The Michelson / Morley experiment and the Special Theory of Relativity

We know that the two theories are profoundly different, we can say one opposite to the other.

Michelson and Morley assumed the existence of the ether that would have been caused the difference of the light speed in the two arms of the interferometer.

Thus, for Michelson and Morley, one would arrive at the following conclusions:

A) Vector composition of the speed of the Earth with that of the light
B) Consequently the speed of the light is not constant, is different from c
C) Absolute reference point, and therefore the possibility to calculate the absolute speed.

Relativity, on the contrary, is born because the experiment gave null result, and thus:

A) No absolute reference point, but only relative to an observer.
B) Constant speed of the light, c, in all reference systems.

We will see that even if the two theories are one the opposite to the other, they give exactly the same result, and one not exclude the other.

Chapter 1

The following figure shows the Michelson/Morley experiment:

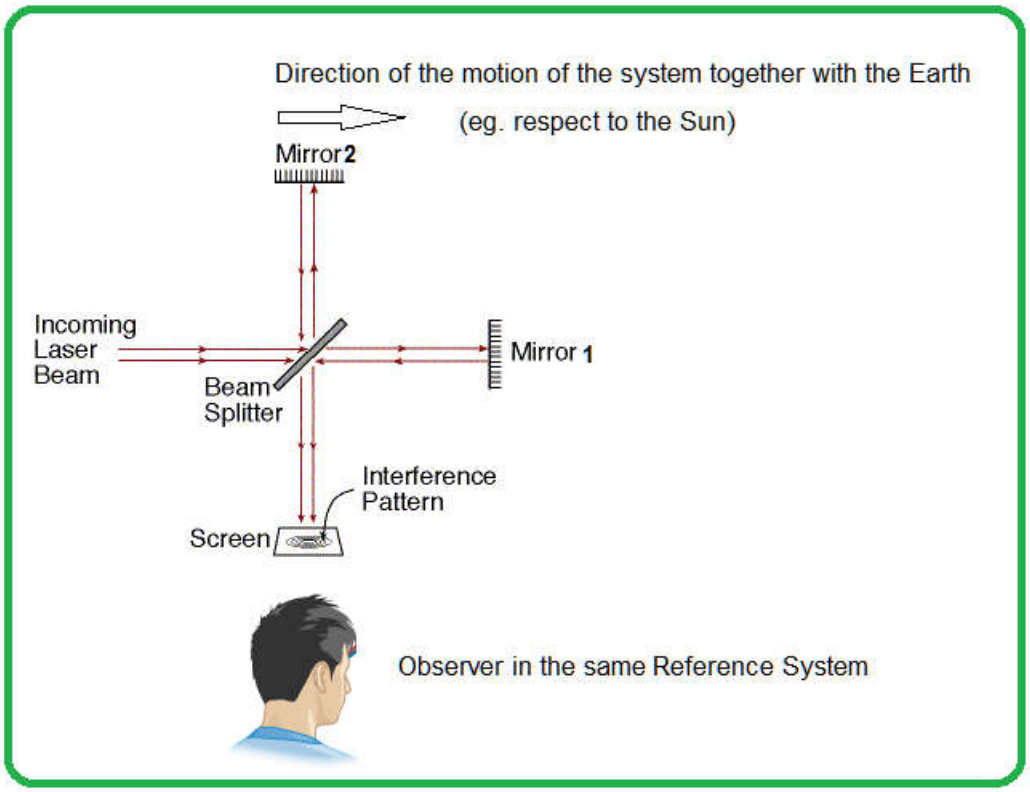

Figure 1.1: The Michelson /Morley Experiment

The scope of the experiment was to find the difference of the light speed on the two arms of the interferometers due to the vectors composition of the light speed with the Earth speed, that should gave a resulting different time to cover the same space of the two arms.

The result was null, the light speed is constant in the two arms, and the conclusion was that the light speed is constant for all reference systems.

The goal of the experiment was to find an absolute point of reference and then absolute speed, not find eventual time dilations between reference systems.

Let us now imagine seeing the same Michelson / Morley experiment but placing ourselves outside the Earth, let's say from the point of view of the ether.

We will see the interferometer, together with the Earth, moving in front of us.

From the outside, the Michelson / Morley experiment can be considered the **very summary of Relativity:**

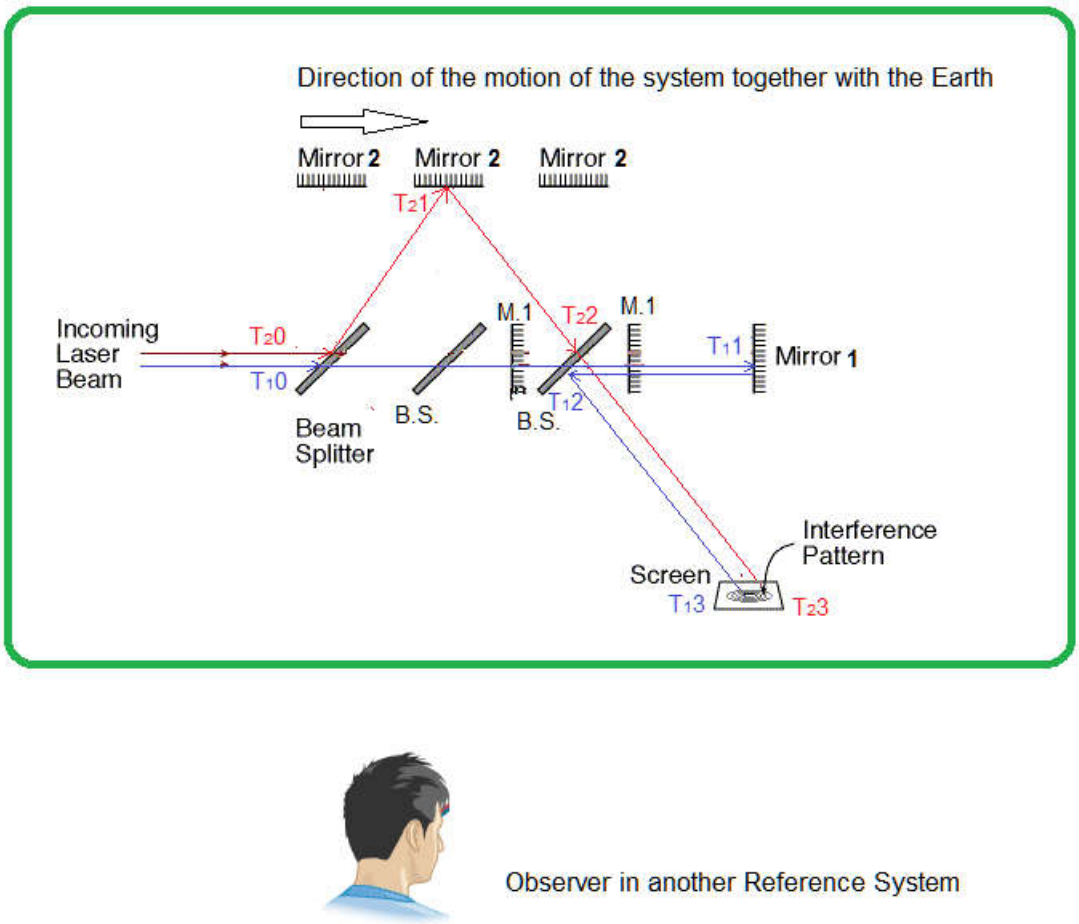

Figure 1.2: The Michelson/Morley experiment from another point of view.

We will in fact have:

1) The arm of the interferometer perpendicular to the motion, that means the beam splitter/Mirror 2 space, is simply the Einstein light clock (the light beam that is reflected between the two mirrors, lower and upper one).

This is the situation examined by Einstein to calculate the time dilation that should occur between the two reference systems.

2) The interferometer arm parallel to the motion, the space between the beam splitter and the Mirror 1, on the other hand, it is examined by Einstein for the contraction of lengths in the direction of motion.

This situation was also examined by Einstein to highlight the non-simultaneity of events with the thought experiment of the light source inside the train in motion, which reaches the walls of the train simultaneously for those are on the train, and at different times for those are on the dock, that is, for an external observers placed on another reference system as show in the Figure.

This thought experiment, highlighted above all others concepts in its original publication, laid the basis for saying that the simultaneous phenomena, that is synchronous for a reference system, are not for the others, and therefore that time can flow differently in reference systems moving respect to each other.

Michelson/Morley VECTORS calculation: Arms perpendicular to the motion

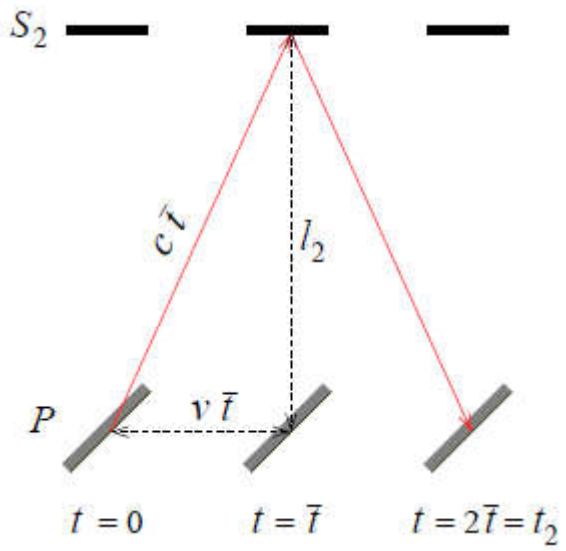

Figure 1.2: calculation of the resulting SPEED of the light in l2 section

Let us now examine the Michelson / Morley experiment, in particular with regard to the arm perpendicular to motion. The data are:

V = displacement speed (in this case, of the Earth).
C = speed of light displacement in the ether, unchanged, constant.
V2 (in section **l2**) = resultant velocity of light in the perpendicular section.

Hence the relationships between the speeds:

$$v_2^2 + v^2 = c^2 \Rightarrow v_2 = \sqrt{c^2 - v^2}$$

v2 is therefore the resulting velocity of light in the perpendicular section, **different (in this case less) from c**.

Knowing the distance l2, we can therefore calculate the travel time of the round-trip radius in the section **perpendicular** to the motion given by:

$$t_2 = \frac{2 \cdot l_2}{\sqrt{c^2 - v^2}} = \frac{2 \cdot l_2}{c \cdot \sqrt{1 - \frac{v^2}{c^2}}}$$

This is what **Michelson and Morley** have calculated, who then compared with the time that the beam would have taken to travel in the other direction, the direction of the motion (between the beam splitter and mirror 1, blue ray following the Figure 1.2).

But, before proceeding with the calculation of the speed and then the time that the ray takes in the direction parallel to the motion, we want to know how much this time, t2, INCREASES DUE TO THE SPEED OF THE EARTH WITH RESPECT TO THE ETHER (that is the external observer in our example), therefore with Earth velocity with respect to the "ether", the external observer, equal to 0.

Let us then set vt = 0, and calculate the ratio between the time taken by the radius considering the Earth in motion with respect to the external observer/ether, and the time taken by the radius if the Earth was stationary with respect to the observer/ether:

$$\beta = \frac{t_2}{t_0} = \frac{\dfrac{2 \cdot l_2}{c \cdot \sqrt{1 - \dfrac{v^2}{c^2}}}}{\dfrac{2 \cdot l_2}{c \cdot \sqrt{1 - \dfrac{0^2}{c^2}}}} = \frac{2 \cdot l_2}{c \cdot \sqrt{1 - \dfrac{v^2}{c^2}}} \cdot \frac{c}{2 \cdot l_2} = \frac{1}{\sqrt{1 - \dfrac{v^2}{c^2}}}$$

We obtain **exactly the time dilation coefficient of the Theory of Relativity**, this time however obtained from a **vector composition of the velocities**, therefore assuming that the **speed of light in the perpendicular section in the moving system is not constant, but relative to the observer** means us/ether.

Following the Einstein theory is how to say: when for you (system in motion respect to mine) the clock signs for example 1 second, that is the time taken by the ray to go vertically from one mirror to the other one, I measure the same event in 20 seconds, because for me (external observer) the same ray takes MORE time to cover the same distance between the mirrors because **MORE slower than c in YOUR reference system**.

The same event, ticking clock, take for me (external observer) more time due to a different speed of the light in your reference system respect to mine. The same event, ticking clock, its for me (external observer) last longer than your in your moving system.

In others words: the time dilation can be due to a different (slower) speed of the light in the perpendicular section of the moving system respect to our one. The light that is perpendicularly reflected between the two mirror in the Einstein light clock, **is slower than c in the moving system** respect to us, and this is the reason of the time dilation between the two system..

Following the Special Theory Of Relativity, we can consider each observer absolutely stationery and consider all other object moving respect to us (and vice versa).

We can't say that the external observer is absolutely stationary, but the example is in any case valid as in the Theory Of Relativity, because we are talking, for the moment, about the relativity of the light speed between the two systems, that means, again, the relativity of the flow of the time between the two frame of reference.

We are just putting in evidence that the time dilation can be due to the constancy of the speed of the light in all reference systems (Theory of Relativity), or can be due to the difference of the light speed in the two reference systems as show. We don't know. Both of these reasons, give exactly the same results.

So, we can consider the experiment of the Einstein clock (means the Michelson/Morley interferometer arms perpendicular to the movement direction), in which the beam that is reflected into its reference system (ie **vertically**) has a **resulting velocity lower than c even if this difference of speed is not, and can't be, recognise within the same moving system.**

Therefore, to consider c constant in different reference systems in motion one with respect to the other (R.R.), it is TOTALLY equivalent to considering the vector composition of velocities, ie the speed of light different from c, within the same reference system (M.M.).

Since formulas and results are totally equivalent, it is implied and not excluded that **within the SAME reference system there may be a speed of the light different from c (in this case less).**

New aspects that are added to the current special relativity

The two hypothesis are totally equivalent and we can use one instead of the other.

So, we can use the explained example, we invert the position as described in the Theory Of Relativity, and the result is exactly the equivalent (the resulting speed of the light in the other system is less than c respect to us).

But if we ADD the possibility to have an absolute stationery point of reference (ether or EQUIVALENT concept), this exchange between the two reference point will not be necessary.

Just one of them will have the own time less than the other (the shortest): who is in the same reference system of the absolutely stationery point. All the others reference system will have the time dilation depending by its speed respect to this stationery point.

The relative time dilation between two reference system is till valid, we just add that both of them have also a relative proportionally time dilation respect a common absolutely stationery point, if exist and if it's possible to determinate it.

In that case the important consequence is that even if the time dilation will be exactly the same between the two reference system as today, the more time dilation will be ONLY in the reference system that effectively have more speed respect the common and absolutely stationary point of reference.

The Theory of Relativity between two referent system will be not more exchanged between the two reference system: just one of them will have effectively more time dilation respect to the other, and not more vice versa.

In addition, the time dilation, ie the slowing down of the time in the moving system respect the stationery point, is REAL and not only APPARENT respect an external observer, as well as the

contraction of space (also in this case exactly EQUAL in the Theory of Relativity and Michelson/Morley calculations knowing the null result of the experiment, that is $l' = l \cdot \sqrt{1 - \frac{v^2}{c^2}}$).

This last is mandatory, otherwise we will have two different time in the two arms of the interferometer, and we will able to detect our speed.

All the existing experiment (GPS satellite, muons, air plane around the Heart and so on) can bee seen according to this new point of view also, since in all the case we recognise a time dilation in just one side, means in the moving system respect to us.

I mean that moving system respect to us, could have more speed respect the eventual common absolutely stationery point of reference, so only in that system respect to us we detect the time dilation (independently by the reason of the time dilation intended as final effect..), and not vice versa.

This eventual common absolutely stationary point of reference does not means necessarily the ether, but an equivalent thing referring just the possibility of determinate this point.

Conclusions:
There aren't difference between the Theory of Relativity of Einstein (the light speed is the same for all reference systems), and the Michelson/Morley theory (light speed in the moving reference system is not constant but depend by the relative speed between the two system **and/or** respect an eventual common absolutely stationery point of reference).

So, the speed of the light can be different from c, even if APPEAR c on EACH reference system.

Both of them produce the same result, and one not exclude the other.

So the question are:
-What is the right one?

-What are the implications if the light speed can be different in different reference systems depending by the speed between them and/or between them and an eventual common absolutely stationery point of reference?

-How the light can have different speed in the moving reference system, but appear in any case c for each reference systems?

These and more questions will be analyzed in the next chapters.