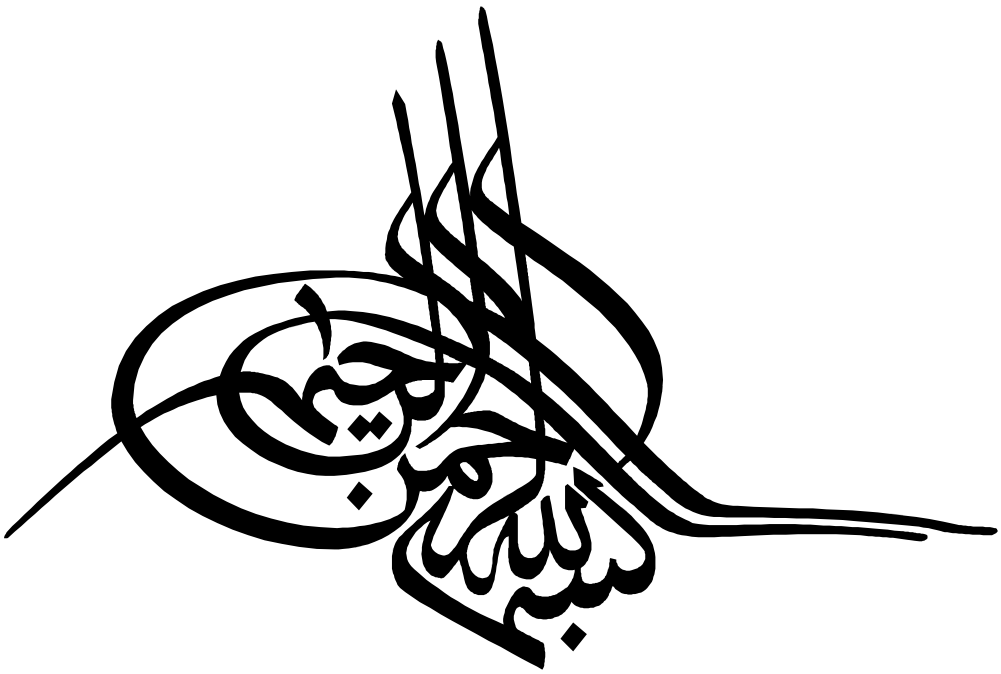
Real Relativity

Critiques of Einstein's theory of relativity

Author: Farooq Quraishi



All rights are reserved for the writer

Contents

Preface....4
Relative or Absolute....5
Understanding of fundamental quantities....6
New Dilemma....11
Imperfect design....16
Michelson-Morley Experiment....24
Comments about Michelson-Morley Experiment....27
Interferometer A....31
Interferometer B....37
Interferometer C....38
Interferometer D....42
Relativity and Electrodynamics....43
Amended Lorentz Electrodynamics....44
Velocimeter....45
Restriction in measuring Force and Energy....47
Preferred Frame of Reference....49
General Relativity....52
Equivalence principle....53
Space-time Continuum....56
Einstein`s mass–energy equivalence....57
Relativity of Force-Energy effects....57
Relativity of Force and Energy Effects and SR....61

Preface

Twentieth century has witnessed great development in the science history. One of the most important aspects of this evolution is Einstein`s theory of Relativity, which scientists regard it more important than the Galilean – Copernicus revolution. At first this theory encountered resistance by nearly all of the scientists but gradually it became accepted and famed as a scientific miracle.

The reality is that Theory of Relativity is a combination of ignorance, contradiction and pure imagination which has no correct scientific foundation.

This book is the translation of Real Relativity (نسبیت حقیقی) which I wrote it in 2001 but published in 2004 by Alazhar publishing company Peshawar and also published by General science journal and other websites like CPH theory. The original book is written in Persian language.

This is the concise version of article. I hope I can release the detailed and complete version in next future.

Farooq Quraishi

May- 9- 2008

Emails: quaraishis@yahoo.com

mfqquraishi@hotmail.com

Relative or Absolute

Any thing which has effect has reality, so the universe which is consisted of numerous moving bodies in unlimited space has been accepted as a real existent and tried to know it deeply. The results of these attempts are today`s Sciences and Arts.

One of the greatest scientists is Isaac Newton who used mechanics to explain motion of celestial bodies. For explanation of the dynamics of moving bodies he was constrained to define the Time and space hypothesis. Mass, Space and Time are three components of physical entity and are the main elements in physics.

Newton assumed Space and Time as distinct and independent elements. But he says that the measurements of them are relative matter and subjected to the conditions of measurement.

After many years scientists encountered few experiments, which were inexplicable at that time. In order to flinch from solving that problems these scientists especially Einstein by proposing the theory of relativity soak asylum under philosophical relativism.

Brief about Relativity notion

Relativism is a philosophic idea which is contrary to Absolutism. According to this thought, the world is what I know and perceive, so every one can have his own perception from the world and assumes it as reality. This idea is a decisive answer to any question about conformity of their imagines with outside facts. (For example the concept of Ptolemaic system was contrary to the Copernicus system which is accepted as a fact.)

The theory of relativity which is based on the relativism by using few deficiencies of classical mechanics became able to suppress other theories and finally overcame and became a generally accepted theory.

Theory of relativity is originated from the following reason:

Considering the motion and its outcomes like velocity, acceleration and Forces as relative matters

Relativity of measurement process

Existence of deficiency in classical mechanics which failed to explain some phenomena

To flinch from finding answer to few unexplained events and getting rid from Michelson-Morley experiment

Doubt in Absolutism initiated from historical evolution

Lack of precise definition and cognition of Time; caused the unscientific notion like passage of time and motion in time dimension which are only created by thought and feeling of human kind entered physics

Understanding of fundamental quantities

When some one ask you what is a pen? Best answer is to put a pen in front of him and say: "This is a pen". Any description about the pen is a comparison between the pen`s component and known things in the mind of questioner. Likewise defining anything is only comparing it with some known things in the mind of addressee in order to capable him to resemble a similar image of that thing in his mind.

Light and Sound have physical existence. Suppose a scientist wants to introduce these two physical phenomena to a deaf student. He can introduce light with experiments like turning light on and off and also by reflecting and diffracting light waves in laboratory to his deaf student, and the student who has healthy eyes can see this phenomena and understand them, but how the professor can introduce sound to this student who is deaf and doesn`t have ears.

The student doesn`t have any concept and perception of sound. When the professor defines sound he can not imagine and simulate it in his mind and so he can not understand it. Only the student can see vibration of sound sources like diapason and chord`s thread.

When the student watches vibration of diapason and drum`s surface and see the understanding and response of scientist to these events with closed eyes, he accepts existence of another sense which informs and introduces these events to professor and is named sound but he don`t know it. This was a brief to remind limits of our understanding abilities.

Space

Space has been defined in many ways

Newton assumed space as an external absolute phenomenon which is independent from observer. He says:"Absolute space is constant and motionless because of its nature and without relation with any other things".

Despite Newton, Einstein honestly acknowledges that he doesn`t have any perception about space and thereby he substitutes it with motion concept. Nevertheless about space he says: "... I hoped to show Time-space continuum is not such thing that should be considered independent form mass. Objects are not in space but they continue spatially therefore empty space is meaningless" also he says: "concept of space as an entity which has reality and independency form objects belongs to thought before science, but the idea of existing unlimited space which are moving relative to each other is not so. from logical point of view the last concept is

inevitable but it is far from acting any role in scientific notion.

Considering scientists` ideas and what I`ve mentioned, it is obvious when we want to define space we try to resemble it in the mind of addressee by using known images or simulating it by using other senses. In order to see and know any thing light should come from that thing to eyes and by eyesight sense it can be understood. Also for understanding with other senses some kinds of physical signs carried by elementary particles and other physical events like impact and forces should be there in order to make knowledgeable information in human sense organ and mind.(for example sound is carried out by oscillations of air`s molecules)

Unfortunately space has no mass (real or virtual), so it can not reflect light and there will be no picture of it in human mind and it can not be seen by eyesight. Likewise because of having no mass it can not affect any mass or natural forces, so it can not be understood by other senses. In this case our knowledge about space is like perception of deaf student from sound.

It is said that an acceptable definition of reality is to be source of effect, so space by having obvious affects like surrounding moving bodies and volume is absolute and independent reality and it is identifiable closely and indirectly. Thus we can analysis Einstein`s ideas.

To reject Einstein`s assertions I use his own comments. He says: "it is hard to take it serious, Kant`s attempt for effacing this problem with denial of objectivity of space

Possibility of filling box has objectivity as box itself or what fills box has". Also he says: "Of course it is sure that continuum gets root form our experience from touching solid bodies but it doesn`t mean that continuum concept can not exist when there are no such provisions. Such concepts can be verified indirectly for their importance for understanding of experimental results, so stating the continuum concept belongs only to objects is baseless". In continue he says: "If pay our attention to vacuum space in a thermometer we can disarm the last Kant`s follower."

We know that motion is change of position respect to other object or changing the distance between objects which are located in space. Similarly in all definitions of motion presence of space is a prerequisite. It means concurrent to definition of coordinate system for measuring of movement we accept the spatial place for that coordinate system.

Accepting existence of moving spaces results to the following contradictions:

Multiplication of spaces requires their separation, but space has no quality and quantity which can be understood with human sense directly. So we can not differentiate those spaces, therefore assertion of existence of multiple spaces has no scientific validity.

Accepting moving space requires an independent coordinate system which space moves relative to it. Every coordinate system located in space and has spatial place. Certainly we can not say

that space is moving relative to coordinate system which means it should be unchangeable. Consequently moving space located in the coordinate system is located in spatial place of that coordinate system. It means moving space is located in another space which it is irrational.

Time

Time is another fundamental element

Newton knows time as an absolute identity and he says: "Absolute time means precise and real time. It inherently and upon its nature and without relation with any other thing continues uniformly. Time is also called instant.

Relative time means apparent time like hour; day, month, and year which are scales coincide or no coincide with instance which is usually used instead of real time.

According to the relativity theory world is a four-dimensional continuum which its initial element is world point. Space and time are ordinary variables of world points and these can be arbitrary up to a limit. Minkowski has defined this worldview as follow:" from now independent space and time should be forgotten and independency is kept by integration of both."

Einstein with questioning classic hypothesis which states there is a universal time which is equal for all observers, designed relativity theory. This classical hypothesis is shown by t = t` in Galileo transformation.

To explain aforementioned theories I should notice our understanding and perception form space and time is like understanding of deaf and blind students from sound and color.

Because time is not comprehensible directly, so any empirical definition will be based on imagination. Therefore imputed uniform and non uniform current to time (by Newton and Einstein) are not empirical.

Imputing current to time is not comprehensible and not approvable. Also you can impute current to time after you`ve defined rest for time; but imputing rest to time is not empirical and baseless.

Time is an axiomatic phenomenon. All accept when we say Sina is 2 years old, we mean from when he is born till now the earth has revolved two times around sun. Here we`ve confessed to an undefined reality which we call it time and this confession is the cornerstone of our empirical definition of time. Whatever can be empirically definable and is the reason for existence of time is simultaneity. So it is essential to define it scientifically.

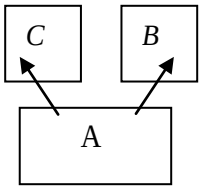
Einstein reminds when we say the train arrives at 7`oclock we mean showing number of 7 by clock and arriving of train are simultaneous. Likewise when we say motion of train has lasted 5 hours it means that beginning of the motion and showing number of 2 by clock are simultaneous.

Also end of motion and showing number of 7 by clock are simultaneous.

Clocks can not measure absolute time. But they are devices which have uniform and precise motion; so their motion is a scale of measuring relative speed motion of other objects. By comparing simultaneity of events with numbers shown by clocks we can compare time of events with each other.

Simultaneity

Suppose by complete decomposing particle A, only two particles B and C are created. Here two particles B and C are created simultaneously. As you know measuring simultaneity of events is not as easy as the above example. In this case observer should measure time needed for light carrying event`s signs from event`s place to observer`s instruments and eyes.



The observer can measure delay of light pulses caused by distance between events and observer and relative motion of events or observer by speed of reflection of light pulse and also effects like Doppler and Aberration... .

By measuring delays caused by distance or relative motion and removing it we can find the actual time of events and their simultaneity. Here simultaneity is an absolute phenomenon. One of major mistakes of relativists is measuring simultaneity of events.

Motion

Motion is an empirical event and axiomatic phenomenon. Empirical cognition of motion is based on observing consequent stasis points and this is the Aeolian`s definition of motion. Accurate or mathematical presentation of motion of an object is pointing its place on a preselected coordinate system.

All knows motion as a relative phenomenon but I think it is an absolute phenomenon. Because:

According to the definition only when there are two separate things and distance between them are increasing or decreasing or they are changing their position relative to other`s coordinate system we can say they are moving relative to each other. Similarly motion is only defined upon changing position of two objects relative to each other and it can not be defined for a single object.

Space points have no mass, so they are not identifiable therefore we can not watch and measure

motion of objects relative to space points. We can only observe and measure motion of two physical objects relative to each other.

This event that two objects A and B are receding or approaching each other is an absolute phenomenon. Because it is the same for all observers, it means all observers whether moving or motionless relative to either A or B, are unanimous about motion between A and B. (It`ll be explained how it can be done). All see A and B are approaching or receding with same velocity. For example two particles A and B are close to each other; they start motion, separate from each other and traverse a distance, then return back and join each other. These are unique events which all observers should be unanimous about them after each observer measure delay of light pulses comes from these events. No one can say that particles were stasis relative to each other or they recede from each other for ever. So this motion is a unique and absolute event. Similarly motion of every two object relative each other is an absolute phenomenon.

Suppose two objects A and B are stasis relative to each other and relative to absolute space at time t. (there are two states, whether an object is moving or at rest relative to space points) At this moment both objects are at absolute rest. At time t` these to objects begin to move at velocity $v$ relative to each other. Now we can not say that these two objects have the same state relative to each other and space points and can`t ignore and neglect this change. At t` absolutely a change is initiated and absolutely distance between A and B has changed so absolutely a motion has occurred. Absolute motion between A and B is also absolute motion of every one relative to spatial place of other and absolute space as a reference frame. But motion relative to space points is not observable and measurable, so what do we mean by motion relative to space and space points? Is it only logic?

If we can find effects and traces of motion relative to space then we can accept it as a reality. Otherwise it will be only logic.

As we mentioned previously, absolute motion between A and B means either A or B has absolutely started to move, or both have started to move (by exerting external forces). This motion is also relative to spatial place of each other or space points and spatial frame. If this motion (change in state of being) causes effects on intrinsic characteristics of objects like internal forces and their equilibrium and effects and has traces, then we can find the absolute mover or movers and absolute velocity of them, and if this motion has no intrinsic effects and traces then both moving and motionless objects are the same and equal, so we can not differentiate between moving and rest object and can not identify mover or non mover.

One question is how to identify the moving object or objects and how to measure the velocity which they`ve started and continue to move and the external force which exerted on every one to move. And other is what is effects of this motion, means what changes occurred to the objects by motion.

Fortunately there are experiments which help us to find these intrinsic effects like Doppler effects, Aberration, quintuplet experiment... . By using these experiments we can find effects of absolute motion on intrinsic characteristics of objects and determine their motion and velocity.

New Dilemma

Discovery of electromagnetic forces by Maxwell create new situation, thus that the Galileo`s principle of relativity is valid about Newton`s mechanic, but it is not valid about Maxwell`s laws. This fact that the Galileo`s principle of relativity is valid in Newton`s laws but it isn`t valid in Maxwell`s electromagnetic laws obliges us to choose correct option from the following possibilities.

A) There is a principle of relativity for mechanics but there is no principle of relativity for electromagnetism. In electrodynamics there is a preferred frame of reference (ether) which light only travels with speed of c relative to it. If this option is correct Galileo`s transformations are applicable and we can find ether frame experimentally.

B) There is a principle of relativity which is valid in mechanics and electromagnetic, but electromagnetic laws is not correct in the form which presented by Maxwell. If this option is correct then we should have ability to do some experiences which show deviation from Maxwell`s electrodynamics laws.

C) There is a principle of relativity which holds in mechanics and electromagnetism, but mechanics laws are not correct in the form presented by Newton. If this option is correct then we should have ability to do to some experiences to show deviation from Newtonian laws, and mechanics laws should be reformulated. In this case the Galileo`s principle of relativity is no longer valid rules (because they are contrary with invariability of Maxwell`s equations.), but other rules are valid which are compatible with both electromagnetism and mechanics.

Some experiments show Newtonian mechanics fails in high speed situations... .

Despite the theory of relativity we can see the option A is nearly correct, but there is a deficiency in Newtonian mechanics, which removing it totally will change the principle of relativity.

Ether Drift

If the preferred frame of reference (which light has only speed of c relative to it) could be discovered empirically then the principle of relativity doesn`t hold in electromagnetic. So scientists arranged many experiments to find it. The most important is Michelson-Morley experiment. All of them are designed in accordance with the following instruction.

According to Aberration of starlight the proposed ether should be constant relative to Sun, and the rotary earth should move through it. An observer on the earth sruface should feel ether drift

which blows by speed of v relative to earth. If suppose v is equal to the orbital speed of earth around the sun nearly 30 km/s, then we have $\beta^2 = v^2/c^2$. Those experiments which their precision is about first grade of β, were not able to show absolute motion of earth in ether (couldn`t find ether drift). But Fresnel and later Lorentz showed how can justify this result by classical mechanics. Therefore measurement of second grade of β became criterion for accepting ether drift. Michelson by inventing interferometer and by cooperation of Morley became able to launch an experiment, which became empirical basis for theory of relativity.

All experiments for revelation of ether drift are invalid because of the following reasons:

Difference between theoretical form and practical design of experiments

Falsity of theoretical form

Imperfect definition of Forces

Earth is orbiting around the sun with velocity v, so it is moving with that speed relative to ether or any reference frame which is motionless relative to sun. (Figure 1)

When in relative motion of earth through ether, the relative motion is attributed to ether then they indispensably assumed earth as a rest object in the solar system. (Figure B) In theoretical form of experiments scientists are searching for ether drift which blows with velocity v relative to stationary earth in the solar system.

The theoretical form of experiments is wrong because of the following reasons:

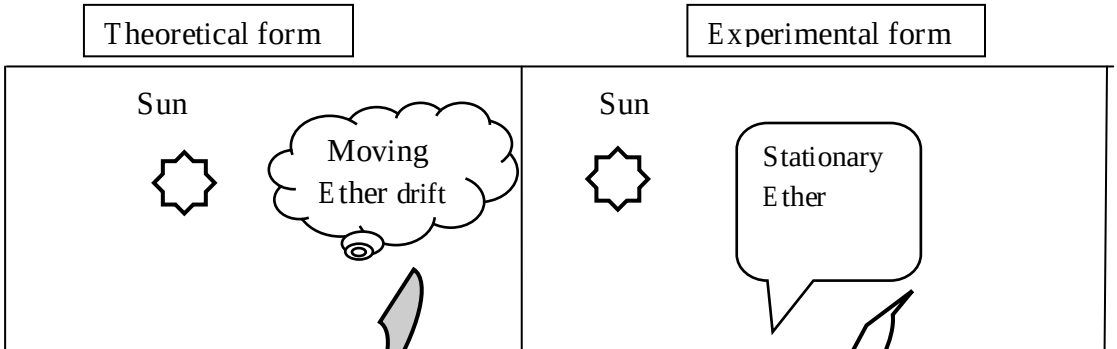
As mentioned according to aberration effect ether is motionless relative to sun and earth is moving with speed of v relative to sun and ether. The theoretical form of experiment is contrary to this. (Ether moves with speed v and earth is at rest in the solar system)

Ether has no known empirical base and is a hypothetical environment which should be verified by experience. Assigning current and current properties to the ether (ether drift) is a prejudgment and preconditions which consist assigning current and current attributes, like water current and air current (wind) for ether which is contrary with philosophy of science.

Empirical from of experiments

Contrary to theoretical form all experiments have done in moving earth relative to motionless ether. Therefore it is obvious that the result of experiments is not liable for theory demands

Important point about these experiments is that most of them made mistakes like design mistake.



Aberration

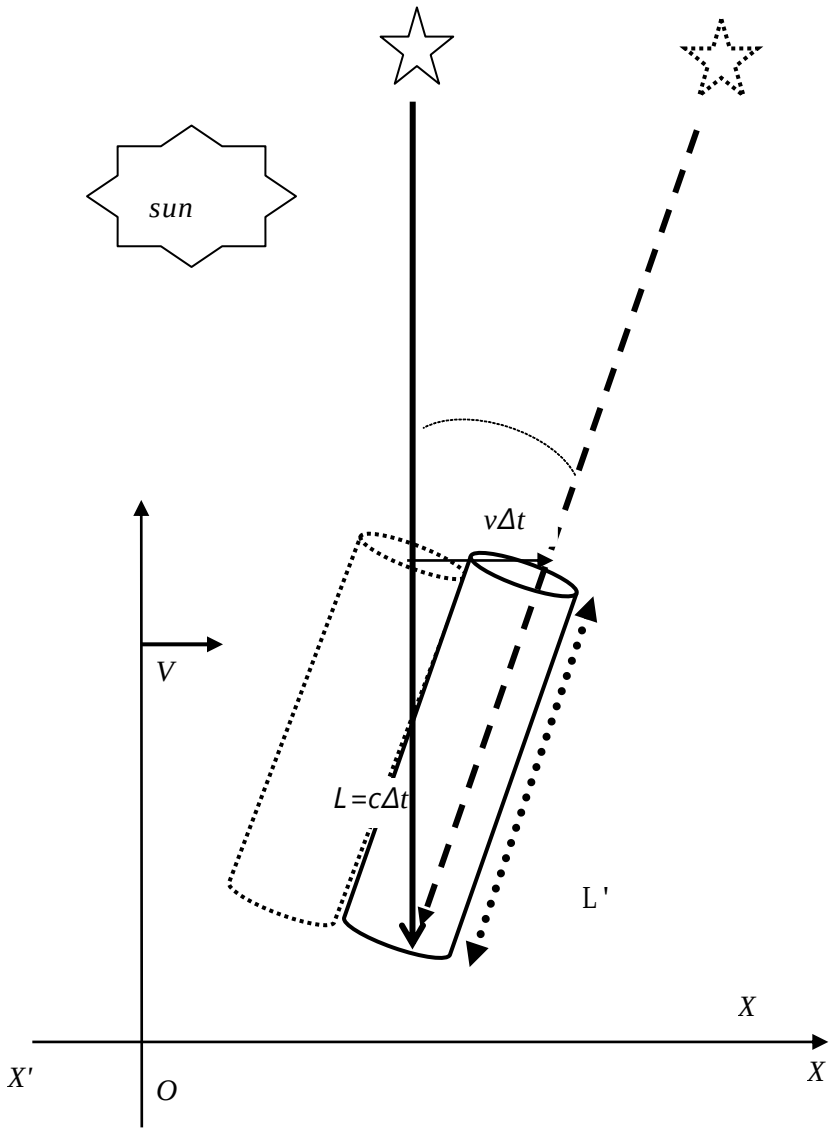
Star aberration is discovered by Bradley. Stellar aberration is an apparent change in the direction of the starlight viewed by an observer on the earth, and it is caused by the Earth`s orbital motion around the Sun. It was explained in the light of the Newtonian corpuscular light theory. Stellar aberration then became part of the experimental basis to support the idea of stationary ether (relative to the Sun).

According to Bradley, Because of the enormous distance between any star and our solar system, the starlight reaches the Earth with a practically Parallel irradiation. According to an ideal observer at rest with respect to the Sun, a terrestrial observer and a starlight pulse meet after traveling two different paths in the same time. According to an observer co-moving with the Earth around the Sun, the same light pulse reaches him with a velocity c ` which is the vector sum of the starlight`s velocity vector c and of a vector v

$$\overrightarrow{C`} = \overrightarrow{C} + \overrightarrow{V}$$

For starts which are exactly above the head and their beam hits earth surface vertically the above formula is equal to:

$$c' = \sqrt{c^2 + v^2}$$


sun
vΔt
V
L=cΔt
L '
X
X'
O
X

The above analyze is the idea of person who believes in existence of ether as preferred frame of reference which the speed of light only relative to it, is c and the velocity of earth relative to it is v.

This observer sees that a light pulse traverse length of telescope which is equal to

$$l` = \sqrt{(c\Delta t)^2 + (v\Delta t)^2} = \sqrt{l^2 + (v\Delta t)^2}$$

At time equal to $\Delta t = l/c$

So speed of light relative to telescope is $c` = \sqrt{c^2 + v^2}$. Similarly the speed of light of other stars is relative to their current position relative to earth is between $c + v$ and $c - v$.

But there are observers who don`t believe in ether as a preferred frame of reference, with precise measurement this observes sees that light pulse traverse the length of telescope which is equal to l` at time Δt, so he measures the speed of light as c` = l`/ Δt . And measured velocity is exactly equal to $c' = \sqrt{c^2 + v^2}$. This observer sees that velocity of light pulse which for example comes from OX side of coordinate system of his frame of reference is equal to c + v and conversely light pulses which come from OX` side of his coordinate system have velocity of c – v . According to this observer speed of light pulse is subject to their direction relative to the coordinate system of his frame of reference and vary between c + v and c – v . This conclusion not only doesn`t support theory of relativity but rejects it, specially the postulate of constant speed of light.

Aberration effect proves some points perfectly:

Light travels with the speed equal to c relative to ether which is constant relative to solar system

Star light which are perpendicular to earth`s motion travels with speed of $c` = \sqrt{c^2 + v^2}$ relative to observer who is at rest on the earth. (The speed of light pulse which come parallel to the earth`s motion vary between c + v and c – v according to their direction)

Speed of light relative to earth is equal to classical sum of speed of light relative to ether and speed of earth relative to ether which is subject of classical sum of speeds.

Aberration by identifying motion of earth relative to ether proves absolute simultaneity and disproves theory of relativity.

Imperfect design

A small mistake has been happened which caused deviation in some important experiments and their conclusion. Here we see historical background and its consequences.

(After they failed to explain the result of Michelson-Morley`s and similar experiment these scientists shifted toward philosophical relativism)

According to these scientists:

"The logical impedimenta which prevent use of principle of relativity in electrodynamics originate from discrepancy between these two issues:

A) *In classical mechanics the velocity of any object relative to observers which have relative motion is different*
B) *But experiences (experiences about ether) show that speed of light independent from observers` motion, always has constant speed of c. (???)*

Because empirical validity of statement about speed of light should be kept; remains no choice but abandonment of first statement;, means abandoning the essentials of space and time recognition as subsisted till now. Now scientists found root of this prejudgment in concept of simultaneity... A comparison of absolute simultaneity is only applicable when motion relative to ether is discovered... from this; it is inferred that absolute simultaneity is not identifiable.

It is told previously that according to Newton: absolute, real and mathematical time without any relation with outside objects and intrinsically flows uniformly.

*From this point Einstein and Newton separate from each other. Einstein thought if points A and B are distinct from each other in space, observer located in A can determine time period of events which happen near A. Observer located in B also can do that about events that happen near B. But it is impossible to compare events in A with events in B without additional premises. Here Einstein cites his second postulate and according to definition he proves that time needed for light to travel from A to B is equal to time of traveling from B to A. (*This proof is contrary to aberration effect).

Thought experiment[1]

Suppose in every point A and B there is a flash lamp. How we can judge whether these two lamps turned on simultaneously? It is obvious if we stand near A rather than B, then we will see the flash comes from point A sooner than B`s one.

Einstein defines procedure of definition of simultaneity as follow:

"Suppose in the frame of reference which A and B are at rest, there is an observer exactly

located between A and B, and he is at rest.

At this situation if the signals from A and B reach observer at the same time, then two events are simultaneous. (???) Then he (Einstein) asks whether these events are also simultaneous for another observer who is moving with velocity u in the AB direction relative to motionless observer? The answer is clearly no(???). Suppose these two events occurred in time s when observer o` passes observer o. Moments later observer o records

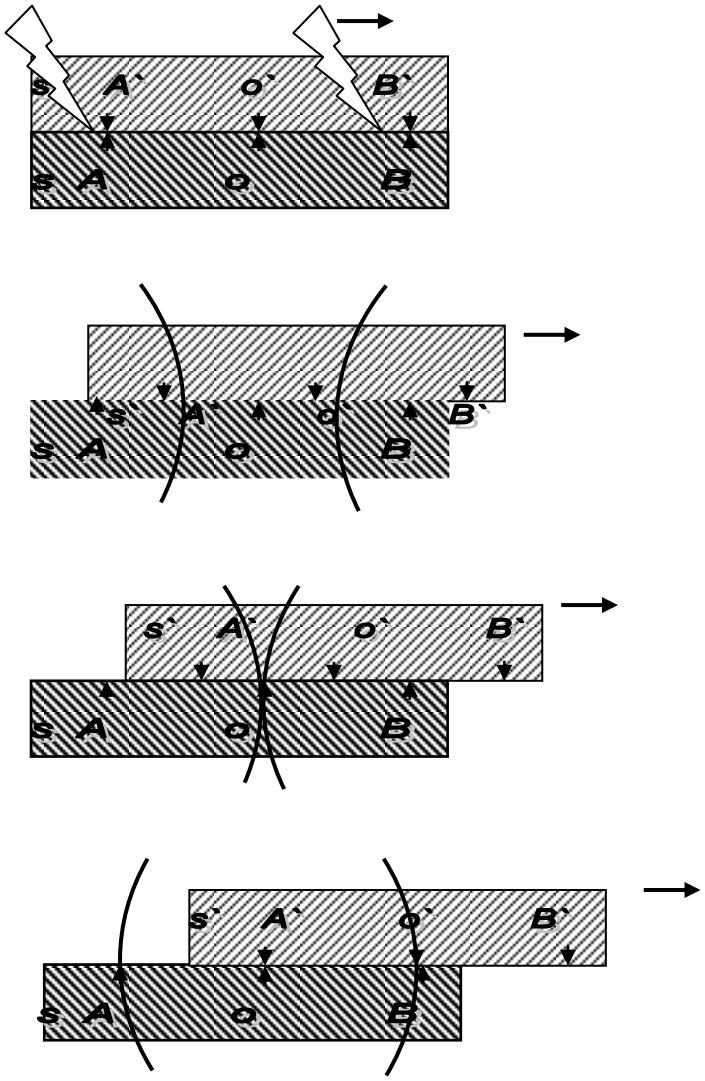


Figure 9-27

both flashes simultaneously, but observer o` is approaching B and receding A with velocity u.

therefore the signal come from B reaches him sooner of that signal from A, and thus he concludes that these two events are not simultaneous. (Figure 9-27)

Indeed before he could be able to judge about simultaneity, he should be sure that he was in midpoint of AB line when lamps flashed.

This hypothetical experiment results that events which are simultaneous to one inertial frame of reference, maybe aren`t simultaneous to other inertial frame of reference which has motion relative to first one.

Now we study, time dilation, one of renowned result of this theory. Our purpose of time dilation is that from a motionless observer point of view clocks which are in a moving inertial frame of reference are ticking slower than the clocks in rest frame of reference.

Time which is measured in this stasis clock is proper time for the stationary observer... this surprising result like any other thing is based on the same fundamental principles of relativity. This theory has caused many extensive dialectical debates especially about twin paradox.

TIME DIALATION

Measurements of time intervals are affected by relative motion between an observer and what is being observed. As a result, a clock that moves with respect to an observer ticks more slowly that it does without such motion, and all processes (including those of life) occur more slowly to an observer when they take place in a different inertial frame.

If some one in a moving space craft finds that the time interval between two events in the spacecraft is t_0, we on the ground would find it that the same interval has the longer duration t. The magnitude t_0, which is determined by events that occur at the same place in an observer`s frame of reference, is called the proper time of the events. When witnessed from the ground, the events that mark the beginning and end of the time interval occur at different places and in consequence the dilation happens.

To see how time dilation comes about, let us consider two clocks, both of the particularly simple kind shown in Fig 1.3. In each clock a pulse of light is reflected back and forth between two mirrors with the distance equal to L_0. Whenever the light strikes the lower mirror, an electric signal is produced that marks the recording tape. Each mark corresponds to the tick of an ordinary clock.

One clock is at rest in a laboratory on the ground and the other is in a spacecraft that moves at the speed v relative to the ground. An observer in the laboratory watches both clocks: does she find that they tick at the same rate?

Figure 11.A shows the laboratory clock in operation. The time interval between ticks is the proper time t_0 and the time needed for the light pulse to travel between the mirrors at the speed of light c is $t_0/2$. Hence $t_0 = 2L_0/c$ and

$t_0 = 2L_0/c$

Figure 11.B shows the moving clock with its mirrors perpendicular to the direction of motion relative to the ground. The time interval between ticks is t. Because the clock is moving, the light pulse, as seen from the ground, follows a zigzag path. (???) On its way from the lower mirror to the upper one in the time t/2, (= $t_0/2$) the pulse travels a horizontal distance of $vt/2$ and a total distance of $ct/2$. Since L_0 is the vertical distance between the mirrors.

$$\left(\frac{ct}{2}\right)^2 = L_0{}^2 + \left(\frac{vt}{2}\right)^2$$

$$\left(\frac{ct}{2}\right)^2 = L_0^2 + \left(\frac{vt}{2}\right)^2$$

$$\frac{t^2}{4}\left(c^2 - v^2\right) = L_0^2$$

$$t = \frac{t_0}{\sqrt{1 - v^2/c^2}}$$

(1-4)

But $t_0 = \frac{2L_0}{c}$, is the time interval t_0 between ticks on the clock on the ground, as in Eq. (1.1), and so.

Figure 11 A light pulse clock at rest on the ground as seen by an observer on the ground. The dial represents a conventional clock on the ground.

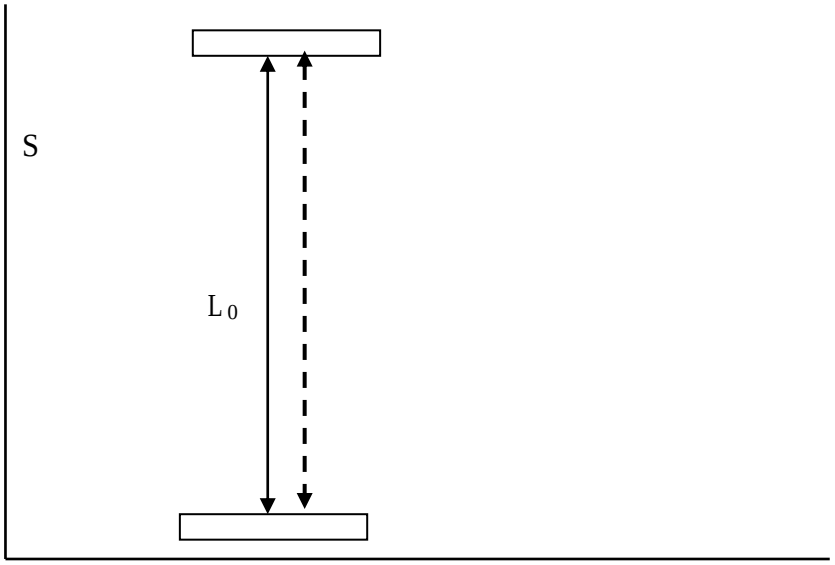


Figure 11.A

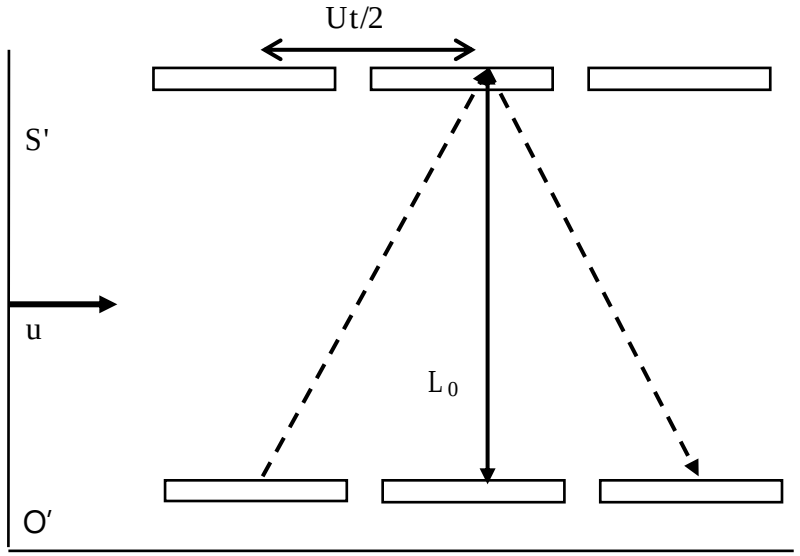


Figure11.B

Figure 11 B light-pulse clocks in a spacecraft as seen by an observer on the ground. The mirrors are parallel to the direction of motion of the spacecraft. The dial represents a conventional clock on the ground.

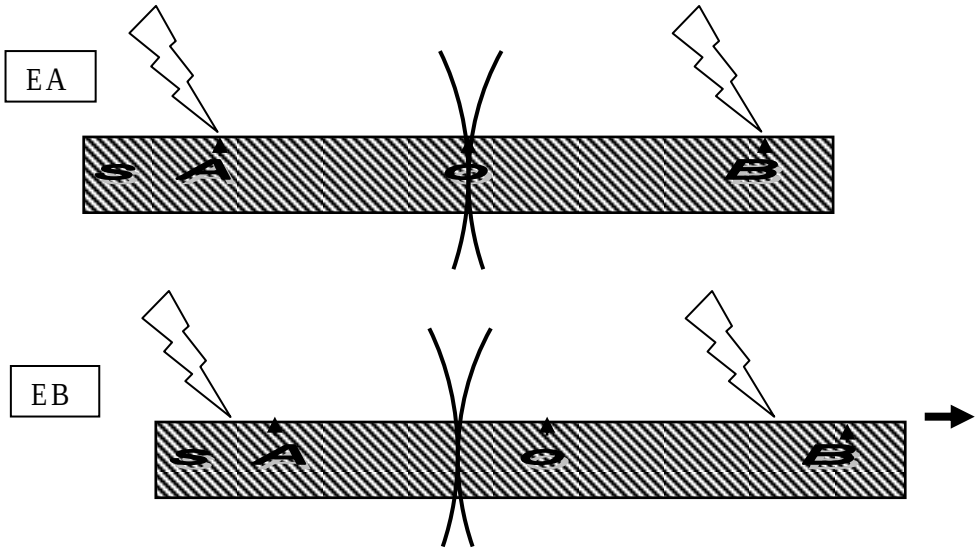
Because the denominator in fraction in (1-4) is smaller than 1 (except when v = 0), so time interval t` is greater than t. it means the observer o infers that mirror clock located in moving frame s` is ticking slowly than his clocks, means run slowly and maybe he says: oh, moving clocks are unreliable and it is better to ensure that time interval only measured by stationary clocks. The observer o` angrily says: "No it is not true, my clock doesn`t run slowly, but it works normally and precisely. Indeed according to my superior clock, contrary to what o has said, his clock runs slowly compared to my clock.

According to relativity she is right. For observer O` located in S`, the stationary clock in S` shows his proper time and clock in moving S runs slowly. So which clock runs correctly? Are both correct? How it is possible? One of these clocks should run slowly. Both can not run slowly relative to each other. Absolutely if one clock runs slower than the other, then the other runs fast relative to the first one, and by returning the moving clock and comparing it with the stationary clock we can judge which one has worked slower than the other. This issue conduces to the twin paradox. (Page 967 – 27-3, Ref 3)

The above mentioned experiment is incorrect because:

Decisive reasons to prove or disprove a scientific theory are highly accurate and well defined empirical experiments, which have no valid contrary experiments. Hypothetical experiments can`t prove or disprove any scientific theory, but they are simulation of empirical experiments in order to understand it easily.

The above mentioned hypothetical experiment is contrary to star aberration, so it is invalid. In order to have a right hypothetical experiment we can do it by simulation of star aberration as follow:



As you see the experiments EA and EB are two different situation of one apparatus. According to relativity theory both apparatus which have uniform motion relative to each other, are completely equivalent and all physical phenomena will be the same for both.

In EA the apparatus is stationary relative to sun frame of reference. In this situation two sparks in A and B occur and light signals of these two sparks simultaneously reach the observer which is confirmed that he is in midpoint of distance AB.

In EB the same experiments repeats, but the apparatus is moving relative to the sun frame of reference and according to aberration phenomena, that result will come to exist which is totally opposite to last situation.

These two experiments show that in the same situation an experiment by different motion relative to sun frame of reference can have many results that it disproves relativity.)

Another example: suppose there are two exactly similar spaceships in earth`s orbit far from the earth. These ships have telescope, speedometer, light-pulse clock and gyroscope. For a period of time the Captains of these two ships keep them stationary relative to the sun and themselves. Stationary ships are equivalent and all physics laws are the same for both. To ensure their equivalency they do some experiments which motion of light pulse between mirrors of light-pulse clock and speedometer and studying aberration of star light and horizontal lengths measured by gyroscope are the simplest of them.

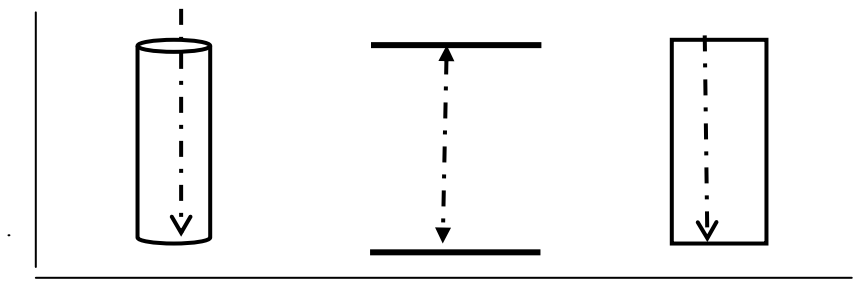
The behavior of light pulse in clocks and speed showed by speedometers and horizontal lengths measured by gyroscopes are the same for both ships. Light pulse cross the telescope length L at time T which the speed equals to c = L / T. speedometer shows no speed, light pulse in clock run in vertical path perpendicular to ship`s surface and gyroscope measures the length of antenna at the nose of its spacecraft equal to m.

When these experiments done one space craft S` start to move in a straight line. After a round trip before S` is approaching S, it arranges to have a uniform motion in order to be an inertial frame. Just when S` is passing S they repeat the experiments again. What happens?

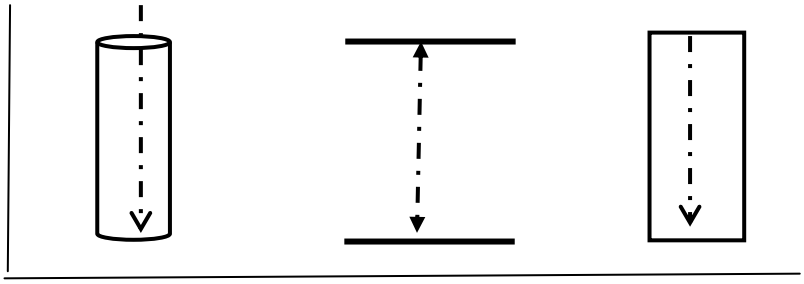
These experiments are simulated by star aberration measured on the earth`s surface.

In stationary ship S no change has occurred. All experiments have the same results as in the past, but in ship S` things go different, and all things have changed.

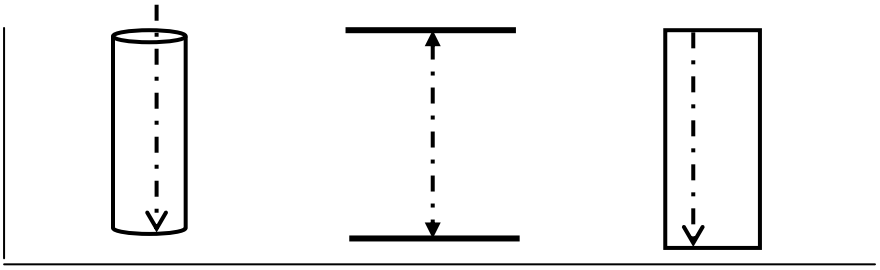
In Moving frame S`, the observer O` sees all light paths in telescope, light-pulse clock and speedometer are slanted and angle of this slanting is equal to α that $tg\alpha = v/c$ in which v is the speed of ship S` relative to sun frame of reference or S. Now telescope should be skewed in order to see fixed star which he saw at previous observation vertically.



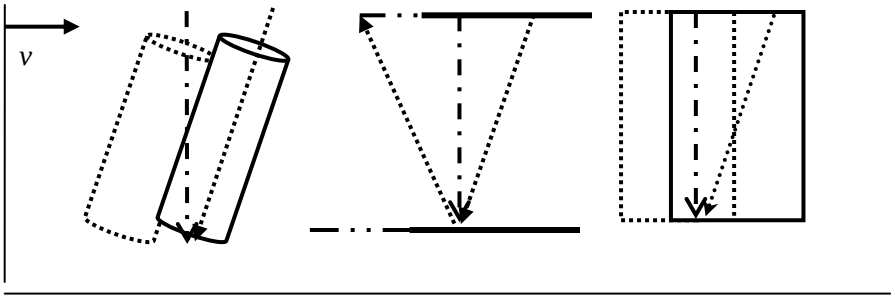
S (stationary)



S′ (stationary)



S (stationary)



S` (Moving)

Light pulses shift is equal to $d = v.t$ (in which $t = 2vl/c$ and v is relative speed of frame S` relative to sun or frame S) and finally come out of light-pulse clock after few round trips.

Speedometer shows velocity v for ship S`.

In the telescope, light-pulse clock and speedometer which the path of light is perpendicular to the direction of ship`s motion, light pulses cross paths equal to L`= h` where:

$$h' = \sqrt{h^2 + (\frac{vh}{c})^2}$$

In the time of $t = h/c$. From that speed of light is equal to

$c' = \sqrt{c^2 + v^2}$

Speed of light in gyroscope is subject to its direction relative to the ship`s direction of motion. It differs from $c + v$ to$c - v$.

According to relativity theory, these two spaceships are equivalent and physics laws are equal for both of them. Speed of light is equal in both frames of reference and every one equally can declare itself as stationary frame, so should not be any difference between S and S`, means the experiments should result the same as in the past.

But we see in second round of experiments frame S and frame S` are not equal and the result of experiments are not the same. The speed of light is different in frame S and frame S`. Even in the frame S` speed of light is not equal in all direction.

Important fact is that the frame S remains the same in both occasion, but frame S` faces obvious changes. So frame S can claim that it is at rest and frame S` is moving, but frame S` can not claim that it is at rest and also can not allege that S is moving, so they are not equivalent and this portion of laws are not equal for both.

Michelson-Morley Experiment

(This experiment has cited from page 962, reference 4)

Diagram which you see in figure 3-27 helps to analyze one of the most famous experiments in the history of physics.

The half silvered mirror M1 divides a light ray into two beams. Beam A moves s toward mirror M_2 and reflects toward M_1. Here a portion of light passes from half silvered mirror and enters telescope. Beam B reflects by M_3 and after passing M_1 enters telescope and interfer with Beam A. Because Beams A and B are initiated from a single light ray, so they are coherent, and after

merging they interfere according to their relative phases. These phase difference will be determined by difference between Beams A and B paths. Now we will show this difference relates to the motion of apparatus relative to ether.

Suppose at the time of this experiment earth moves relative to sun at velocity u. During first portion of light motion along the A path in figure 4-27, apparatus will move along light beam motion path. Thus speed of light relative to inertial frame of apparatus is equal to c – u, and time needed for light to travel from M_1 to M_2 is equal to L /(c – u). Time needed for light to return is equal L /(c + u). Because the M_1 mirror is approaching reflected light pulse at speed of u, therefore time elapsed in the round trip along A path is equal to:

$$t_A = \frac{L}{c-u} + \frac{L}{(c+u)} = \frac{2Lc}{(c^2-u^2)} = \frac{2L}{c}\,\frac{1}{1-u^2/c^2}$$

Now we compute time of a round trip for beam B. when apparatus moves with velocity u relative to the ether. The path for this beam is in figure 4-27.

Therefore length of this path is:

$$2\sqrt{\left[L^2 + \left(\frac{ut_B}{2}\right)^2\right]} = ct_B$$

This simple statements states distance, which is traveled by light pulse in stationary frame of ether at time t_B is equal to ct_B.

If factor L and divide both sides of 27-4 by c then we`ll have: $t_B = \frac{2L/c}{\sqrt{1-v^2/c^2}}$

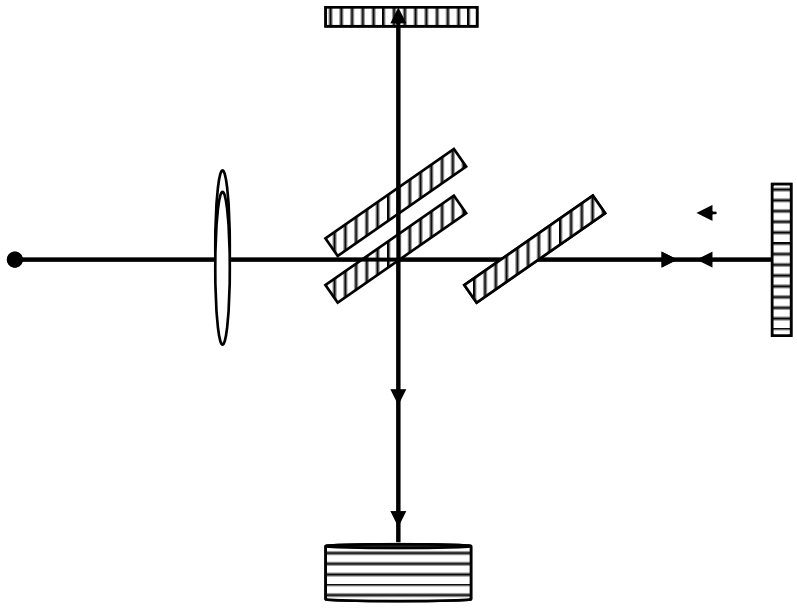


Figure 3-27

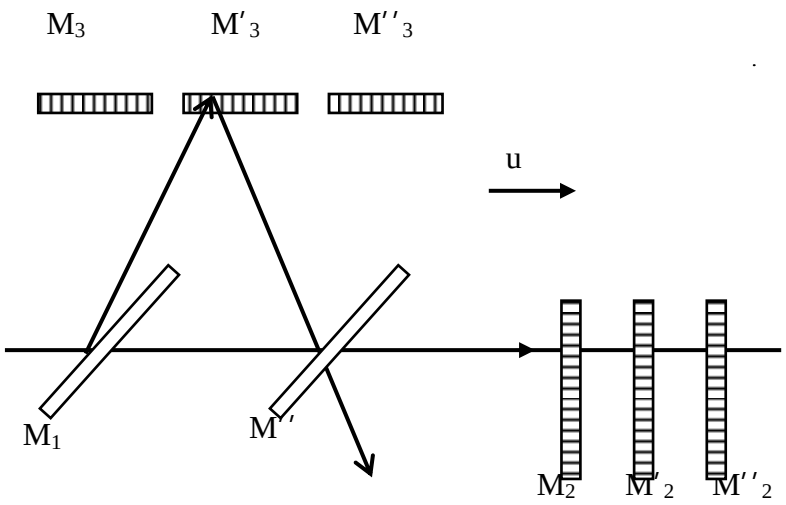


Figure 4-27

Then because of motion relative to the ether, a time difference between these two mentioned paths arises, which is:

$$\Delta t = t_A - t_B = \frac{2L}{c}\left[\frac{1}{(1-u^2/c^2)} - \frac{1}{\sqrt{1-u^2/c^2}}\right]$$

Because $\frac{u^2}{c^2} \ll 10^{-8} \ll 1$. *After simplifying it we will have:*

$\Delta t = \frac{L}{c}\frac{u^2}{c^2}$

If rotate the apparatus 90^0 *paths of A and B will be replaced with each other, thus time difference in this state will be minus quantity 27-7. Therefore whole time difference caused by such rotation will be two times of 27-7 means:*

$$2\pi\Delta t_{(whole)} = \frac{2L}{c}\left(\frac{u^2}{c^2}\right)$$

And this time difference causes the following phase change:

$$2\pi\frac{\Delta t_{(whole)}}{T} = \frac{2\Delta t_{(whole)}\pi c}{\lambda} = \frac{4\Delta L}{\lambda}\left(\frac{u^2}{c^2}\right)$$

In which T is frequency and λ is wave length.

Comments about Michelson-Morley Experiment

In the above mentioned experiment (Michelson-Morley) there are some mistakes:

First: This experiment involved design mistake which previously mentioned. The computed time and path (distance) of beam B (27-3) and (27-4) is not correct. The correct time, t_B is equal to $t_B = 2L/c$. The following formula is wrong:

$$t_B = \frac{2L/c}{\sqrt{1 - v^2/c^2}}$$

Second: In the diagram the aberration is not considered correctly. (Correct diagram is drawn in figure 9 and 10)

By modification the experiment status will be as follow:

Considering the coordinate system of frame related to earth, (Figure 8) there are: Interferometer can rotate 360^0 around it self (in X Z plane of coordinate system Horizontally.). Concerning figure 8 this rotation will occur in 4 stages. In each stage it rotates 90^0 relative to the previous stage. In this 90 degree clock wise rotations the status of interferometer will change form A to B, B to C, C to D, and D to A. If the rotation is counter clock wise then the status will change inversely. Ignoring similar and converse status the above mentioned 4 stages are different and different phase changes are expected.

Each stage is shown by a separate interferometer like A, B, C, and D.

Laboratory frame whihch is motionless relatve to the earth, but it moves with

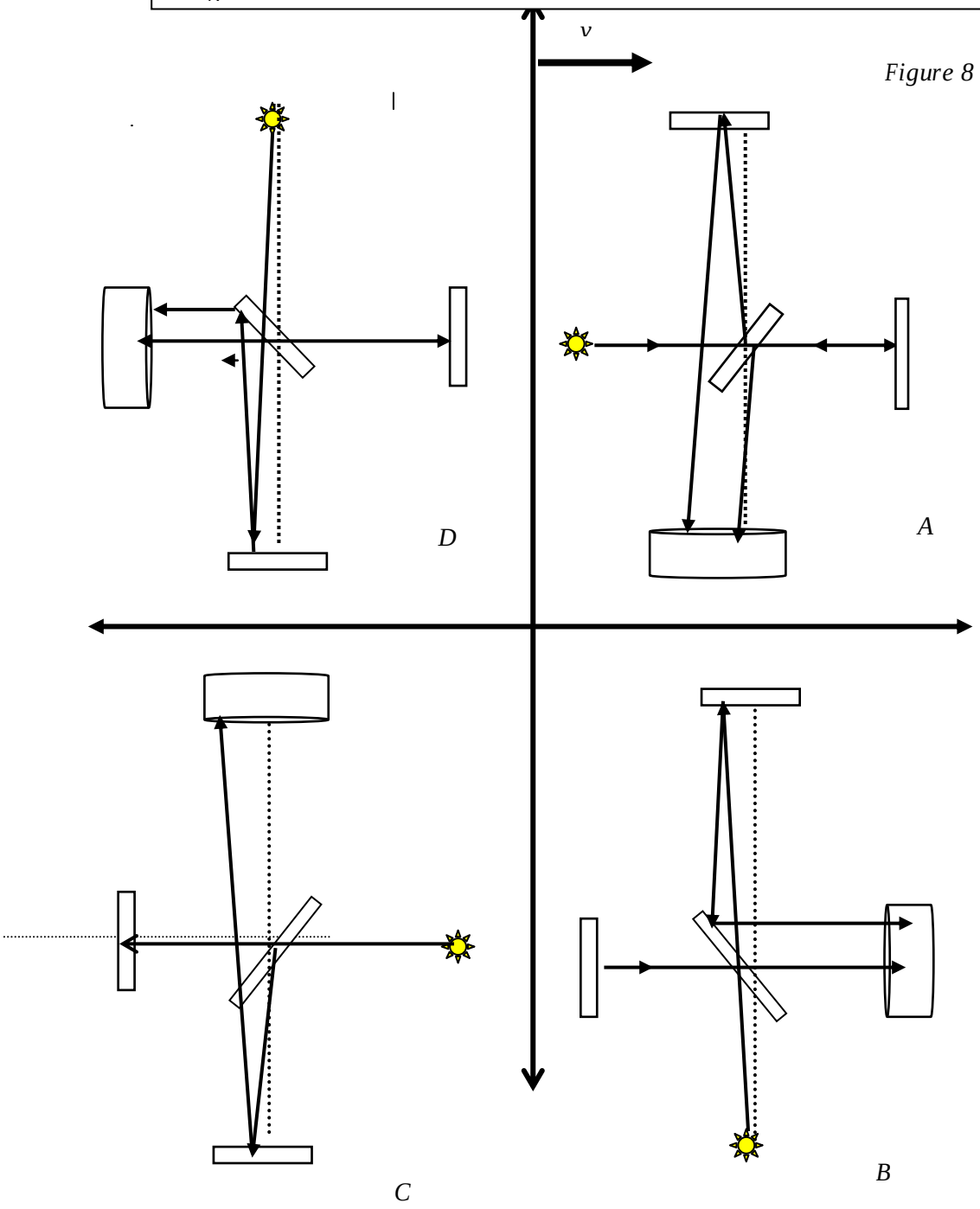


Figure 8

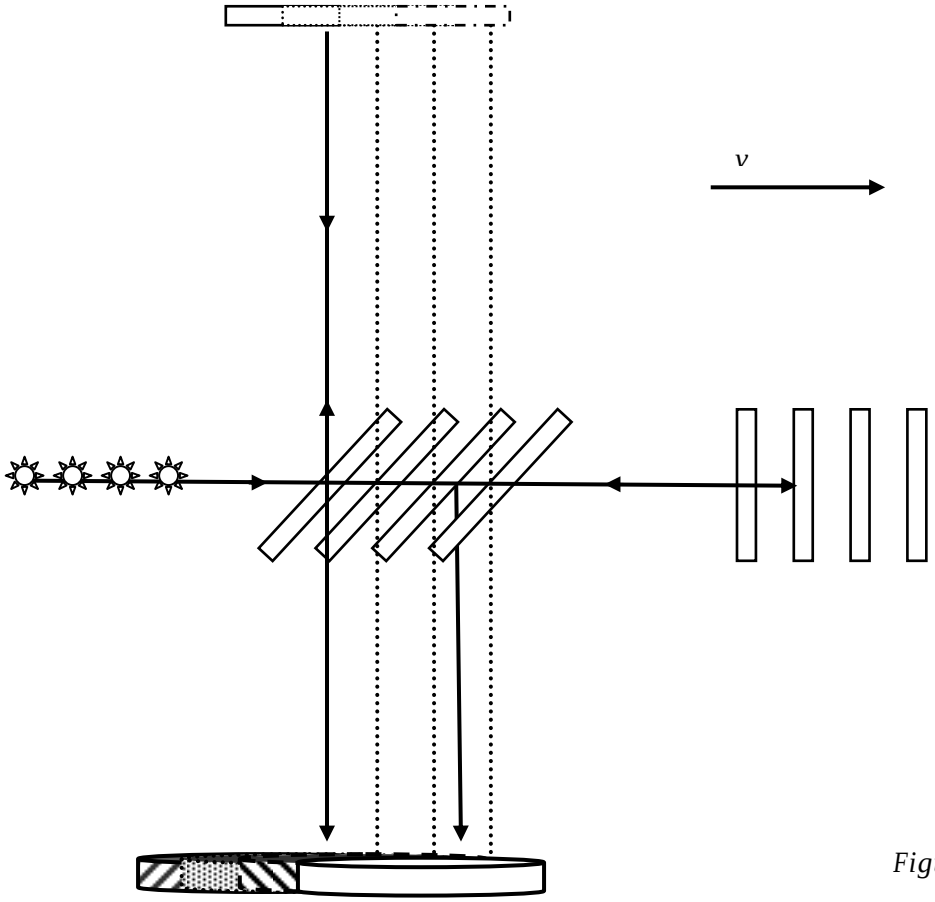


Figure 9

Figure 9

In Figure 9 the stationary observer O (at rest relative to the sun) surveys the motion of interferometer relative to sun by four consecutive pictures. Here the light path are parallel to those of observer's apparatus, so it draw them vertically.

Combining these 4 pictures he has the Figure 9 (above figure)

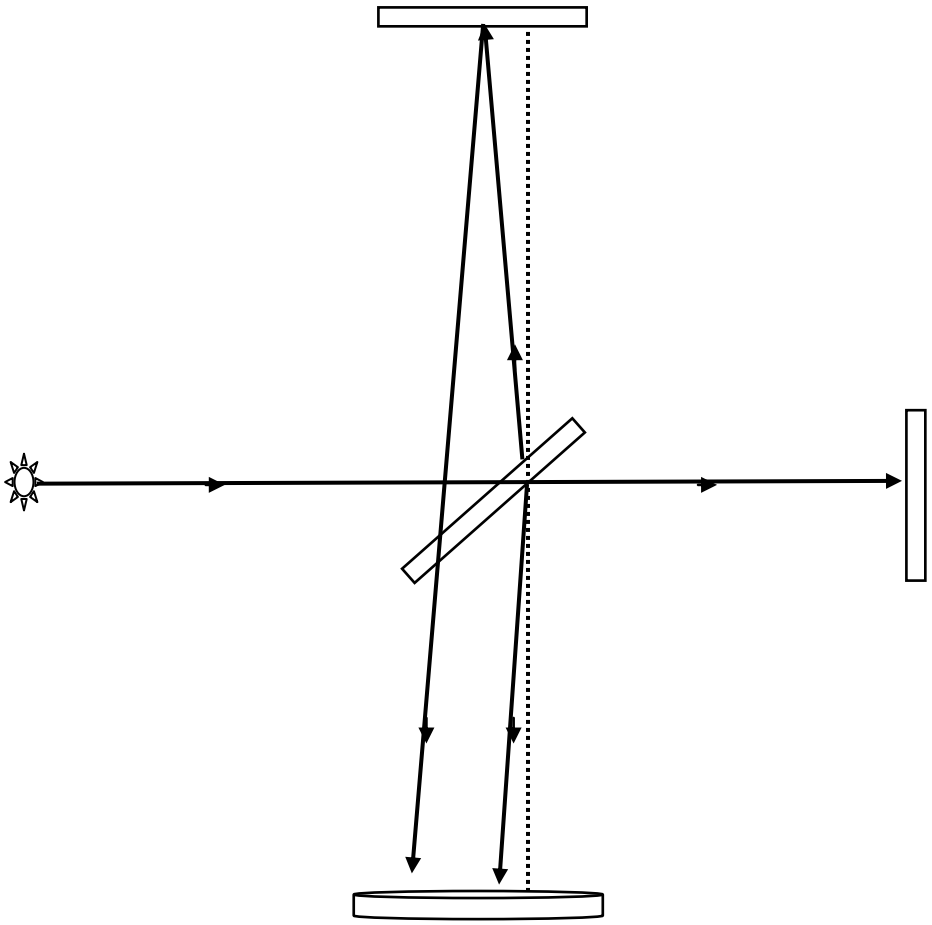


Figure 10

Figure 10 is the same interferometer in figure 9, but according to observation of observer O`. The observer O` is at rest relative to the interferometer and its frame of reference (Earth) and it is moving relative to the sun(and observer O). Here observer O` draws light path considering starlight aberration and Bradley`s experiment.

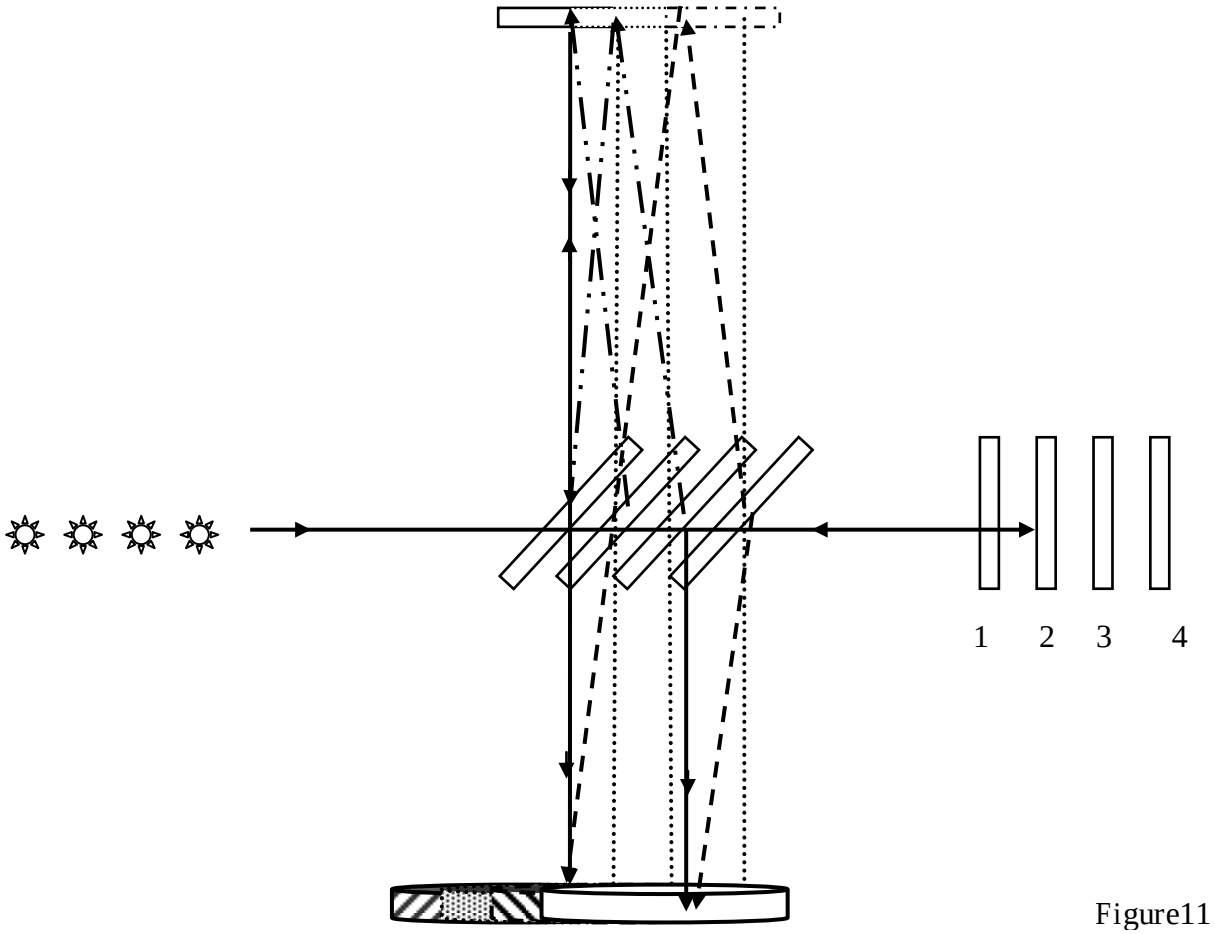


Figure11

Figure 11

In Figure 11 observer O (at rest relative to sun) combines pictures step by step taken by both observers in a single diagram.

Interferometer A

We know that the interferometer is in motion relative to sun. At first stage the X axis of coordinate system lays on motion path. (Figure 12) A light beam emits from source S toward central mirror N. When light beam hits mirror N, the mirror divides it into two coherent beams, one is reflected toward mirror R (parallel to the apparatus motion) and another is reflected toward the mirror M (perpendicular to the apparatus motion). Corresponding to Figure 12 after

reflection by mirrors R and M, light beams again pass mirror N and enter telescope.

Distance between source S and mirror R is SR_1 which is equal:

$$SR_1 = SN_1 + N_1R_1 = l_3 + l_1$$

Distance between mirror M and telescope T is M_0T_0 which is equal:

$$M_0T_0 = M_0N_1 + N_1T_0 = l_2 + l_4$$

Beam B is reflected toward mirror M, (Its path is perpendicular to the apparatus motion). According to light aberration, beam B will have an aberration opposite to the direction of motion, with angle θ relative to apparatus height (Axis Y of coordinate system). So the point light beam hits mirror M, M_1 is far from M_0 by:

$$M_0M_1 = h = vl_2/c$$

M_0 is the hit point of height N_1M_0 on the Mirror M.

According to light aberration phenomenon beam B travels distance of $N_1M_1 = \sqrt{l_2^2 + (\frac{vl_2}{c})^2}$ at time of $t = \frac{l_2}{c}$ and the speed of light is equal to: $c' = \sqrt{c^2 + v^2}$.

In which $N_1M_1 = l_2$ is the height of mirror from point N_1.

In return from mirror M, beam B according to aberration again skews and hit point T_2. Slanted beam B travels M_1T_2 at time equal to $t' = (l_2 + l_4)/c$ at speed of $c' = \sqrt{c^2 + v^2}$.

In which $M_1T_2 = \sqrt{(l_2 + l_4)^2 + (\frac{v(l_2+l_4)}{c})^2}$

According to above statements time spent for light beam to travel form mirror N to mirror M and then to telescope is equal to: $t_2 = t + t' = l_2/c + (l_2 + l_4)/c = (2l_2 + l_4)/c$

When we study light aberration about light beam which moves parallel to the motion of earth relative to the sun, we`ll be able to compute time and path of round trip of light beam A from mirror N to mirror R and turning back to N and finally entering telescope T. it`ll be as follow:

$$t_1 = \frac{l_1}{c-v} + \frac{l_1}{c+v} + \frac{l_4}{c} = 2\frac{l_1}{c}\left(\frac{1}{1-v^2/c^2}\right) + \frac{l_4}{c}$$

Thus time difference between A and B is:

$$\Delta t = t_1 - t_2 = 2\frac{l_1}{c}\left(\frac{1}{1-v^2/c^2}\right) - 2\frac{l_2}{c}$$

The gap created by aberration between beams A and B in telescope is equal to:

$\nabla_1 = 2vl_2/c$

The whole deviation of beam B caused by aberration is

$\omega_B = v\frac{(2l_2+l_4)}{c}$

The whole deviation of beam A caused by aberration is

$\omega_A = v\frac{l_4}{c}$

In stage 2, the interferometer rotates 90^0 counter clockwise and the Y` axis of coordinate system lays on the direction of motion. Thus according to aberration phenomenon paths of light beams shift from hyphenate form to stippled form (Figure 12). After this rotation pathway of SR_1 lays perpendicular to the direction of motion, and slants with angle θ opposite to the direction of motion. The hit point of light beam shifts from N_1 to N_2 in central mirror N. like first stage light beam divides into two parts, beam A` and B` which travel toward mirror R and M. after reflection and passing mirror N these two beams enter telescope. Beams reflected from point N_2 in central mirror hit mirror M and R at points M_2 and R_2 in which have:

$R_1R_2 = v(l_3 + l_1)/c$

Distance between N_2 in mirror R is N_2R_5 which is equal:

$N_2R_5 = q_1 = Q_1R_1 = l_1 - vl_3(c - v)$

Distance between N_2 and telescope is N_2T_4 which is equal to:

$N_2T_4 = q_4 = N_2O_1 + O_1T_4 = l_4 - vl_4/(c - v)$

Distance between N_2 and mirror M is N_2M_2 which is equal:

$N_2M_2 = q_2 = l_2 - vl_3/(c - v)$

Distance between N_2 and source S is S_1N_2 which is equal:

$S_1N_2 = q_3 = S_1N_1 + N_1O_1 = l_3 + vl_3/(c - v)$

Distance between N_2 and previous path of A is N_2O_1 which is equal:

$N_2O_1 = N_1O_1 = vl_3/(c - v)$

After reflection beam A` by mirror R, it hits point N_3 in central mirror N and then enter telescope in point T_3.

Distance between N_3 and mirror R is N_3R_4 which is equal to:

$$N_3R_4 = p_1 = q_1(c - v)/(c + v)$$

Distance between N_3 and telescope is N_3T_3 which is equal to:

$$N_3T_3 = p_2 = N_3O_5 + O_5T_3 = v(l_3 + l_1 + p_1)/c + l_4$$

($N_1O_5N_3$ is a right and isosceles triangle)

Thus time spent by light to travel path A` form point N_2 up to telescope is:

$$t_{A'} = \frac{q_1 + p_1}{c} + \frac{p_2}{c-v} = \frac{[l_1 - \frac{vl_3}{c-v} + \frac{\left(l_1 - \frac{vl_3}{c-v}\right)(c-v)}{c+v}]}{c} + \frac{v(l_3 + l_1 + p_1)/c + l_4}{c-v}$$

Beam B` moves form N_2 toward mirror M. Because its path of motion is parallel to the direction of apparatus motion then it will have no aberration in path but only in time.

$$t_{B'} = \frac{q_2}{c+v} + \frac{q_2 + q_4}{c-v} = \frac{l_3 - \frac{vl_3}{c-v}}{c+v} + \frac{l_2 + l_4}{c-v}$$

Thus difference between times of A` and B` is equal to:

$$t_{A'} - t_{B'} = \frac{[l_1 - \frac{vl_3}{c-v} + \frac{\left(l_1 - \frac{vl_3}{c-v}\right)(c-v)}{c+v}]}{c} + \frac{v(l_3 + l_1 + p_1)/c + l_4}{c-v} - [\frac{l_3 - \frac{vl_3}{c-v}}{c+v} + \frac{l_2 + l_4}{c-v}]$$

The important point is, as a result of aberration, position of beams A` and B` has changed relative to A and B in telescope, which are equal:

Distance between A` and B` is:

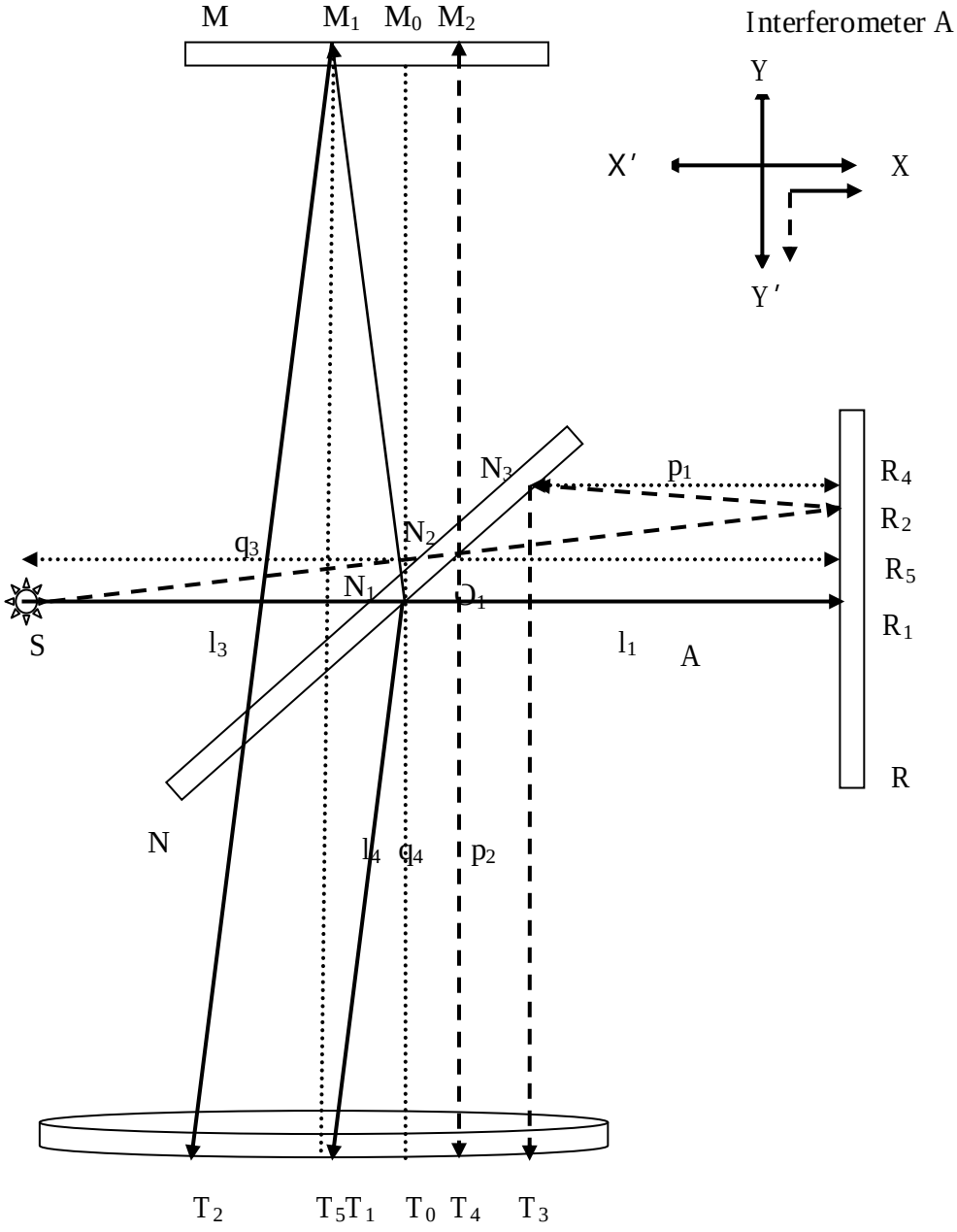
$$\nabla' = \frac{v(l_3 + l_1 + p_1)}{c} - \frac{vl_3}{c-v}$$

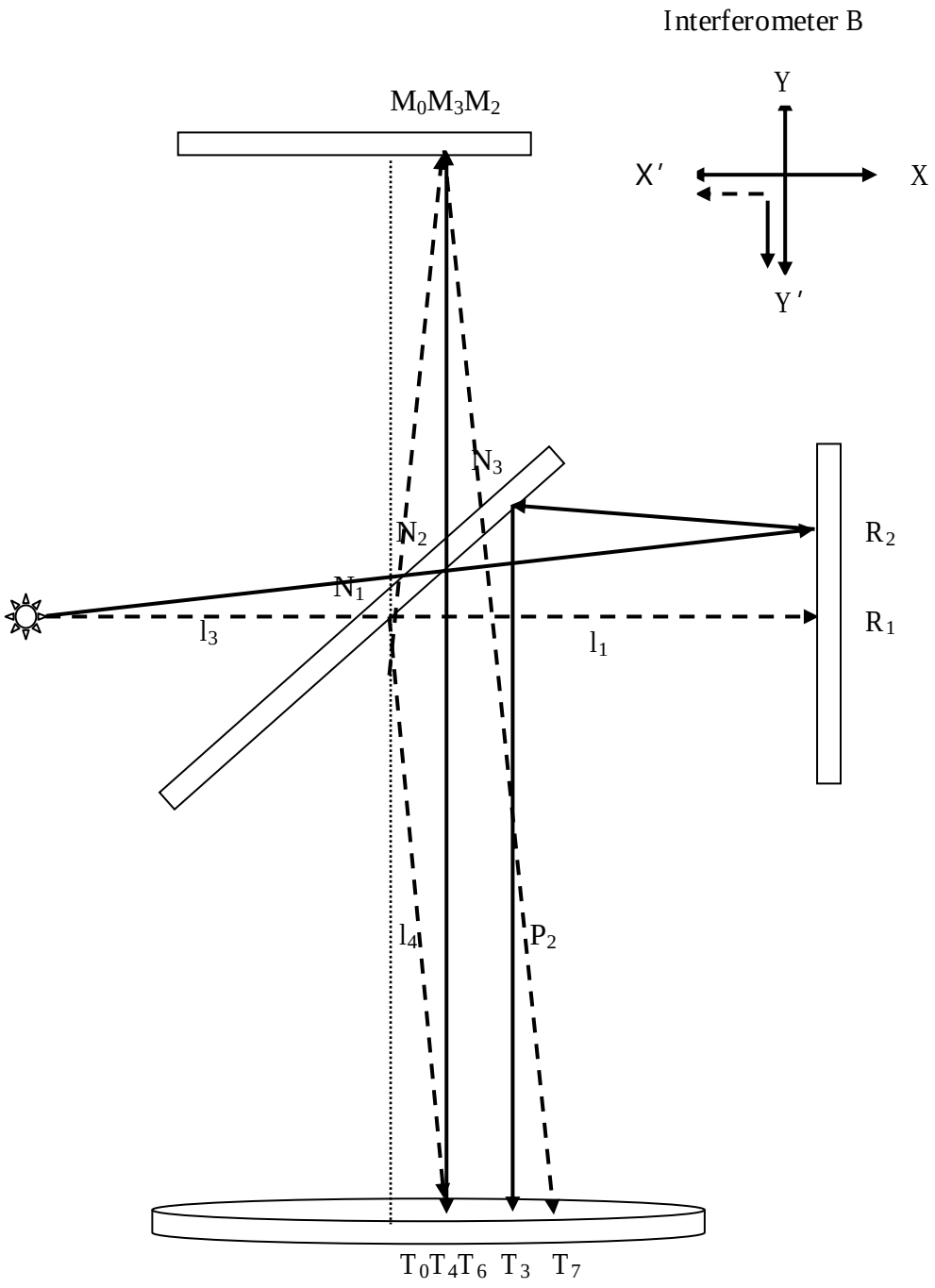
The whole deviation of beam A caused by aberration is:

$$\aleph_{A'} = v\frac{(l_3 + l_1 + l_4 + p_1)}{c}$$

The whole transposition of beam B caused by 90^0 rotation of apparatus is:

$$\aleph_{B'} = v\frac{(2l_2 + l_4)}{c} + \frac{vl_3}{c-v}$$


M
M1
M0
M2
Interferometer A
Y
X′
X
Y′
N3
p1
R4
R2
q3
N2
R5
N1
O1
R1
S
l3
l1
A
R
N
l4
q4
p2
T2
T5
T1
T0
T4
T3


Interferometer B
Y
X′
X
Y′
M0M3M2
N3
N2
N1
R2
R1
l3
l1
l4
P2
T0T4T6 T3 T7

Interferometer B

Case of interferometer B is similar of interferometer A. The only difference is that interferometer has rotated 90^0 and now Y` axis of apparatus coordinate system has laid in the direction of motion. (Stage 1 of interferometer B is equal to stage 2 in interferometer A)

Stage 1: the Y` axis of apparatus coordinates system lays in the direction of motion. Now apparatus starts $90^0$ rotation counter clock wisely. The X` axis of coordinate system lays in the direction of motion and the Y` axis lays perpendicular to the direction of motion (Figure 13). Thus light aberration will occur in the opposite to what occurred in interferometer A and toward X axis of apparatus coordinate system. So we have:

$$t_A = \frac{q_1 + p_1}{c} + \frac{p_2}{c - v}$$

$$t_B = \frac{q_2}{c + v} + \frac{q_2 + q_4}{c - v}$$

Distance between A and B is:

$$\nabla' = 2\frac{v l_2}{c}$$

In stage 2, after the 90^0 rotation we have:

$$t'_A = \frac{l_1}{c - v} + \frac{l_1}{c + v} + \frac{l_4}{c} = \frac{2l_1}{c}\frac{1}{1 - v^2/c^2} + l_4/c$$

$$t'_B = \frac{l_2}{c} + \frac{l_2 + l_4}{c} = 2\frac{l_2}{c} + \frac{l_4}{c}$$

Distance between A` and B` is:

$$\nabla' = 2\frac{v l_2}{c}$$

The whole deviation of beam A caused by aberration is:

$$\aleph_{A'} = v\frac{(l_3 + l_1 - l_4 + p_1)}{c}$$

The whole transposition of beam B caused by 90^0 rotation of apparatus is:

$$\aleph_{B'} = v\frac{(2l_2 + l_4)}{c} - \frac{v l_3}{c - v}$$

Interferometer C

Case of interferometer C is similar of interferometer B. The only different is that interferometer has rotated and now Y axis of apparatus coordinate system has laid in the direction of motion. (Stage 1 of interferometer C is equal to stage 2 in interferometer B)

Stage 1: the X` axis of apparatus coordinates system lays in the direction of motion. Now apparatus starts $90^0$ rotation counter clock wise. The X` axis of coordinate system lays in the direction of motion and the Y` axis lays perpendicular to the direction of motion (Figure 13). Thus light aberration will occur in the opposite to what occurred in interferometer A and toward X axis of apparatus coordinate system. So we have:

In stage 1, we have:

$$t_A = \frac{l_1}{c-v} + \frac{l_1}{c+v} + \frac{l_4}{c} = \frac{2l_1}{c}\frac{1}{1-v^2/c^2} + l_4/c$$

$$t_B = \frac{l_2}{c} + \frac{l_2+l_4}{c} = 2\frac{l_2}{c} + \frac{l_4}{c}$$

Distance between A` and B` is:

$$\nabla = 2\frac{vl_2}{c}$$

In second stage after the 90^0 rotation the Y axis of coordinate system lays in the direction of motion. According to aberration phenomenon path of light beams will change form stippled form to hyphenated form (Figure 14). Following the rotation, the path SR_1 lays perpendicular to the direction of motion and hence it will slant with θ angle opposite to the direction of motion. Hit point of light beam radiated from source S shifts form N_2 to N_5 in central mirror N. This beam like before divides into two beams A and B which move toward mirrors R and M. After reflection by mirrors R and M these beams pass mirror N and then enter telescope. Beams reflected from point N_5 hit mirrors R and M in points R_3 and M_4 which we have:

$$R_1R_3 = \frac{v\,(l_3+l_4)}{c}$$

Distance between N_5 and mirror R is N_5R_7 which is equal:

$$N_5R_7 = O_3R_1 = d_1 = l_1 + \frac{vl_3}{c+v}$$

Distance between N_5 and telescope is N_5T_9 which is equal:

$$N_5T_9 = d_4 = O_3T_9 - O_3N_5 = l_4 - \frac{vl_3}{c+v}$$

Distance between N_5 and source S is S_2N_5 which is equal to:

$$S_2N_5 = d_3 = SO_3 = SN_1 - N_1O_3 = l_3 - \frac{vl_3}{c+v}$$

Distance between N_5 and beam A is N_5O_3 which is equal to:

$$N_5O_3 = O_3N_1 = \frac{vl_3}{c+v}$$

($N_1O_3N_5$ is a right and isosceles triangle)

After reflection from point R_3 beam A` hits N_6 in the central mirror N and then reflects toward T_8 in telescope.

Distance between $N_6R_6 = p_3 = d_1\frac{c+v}{c-v}$

Distance between N_6 and telescope N_6T_8 is equal to:

$$N_6T_8 = p_4 = N_1T_0 - N_1O_6 = l_4 - \frac{vl_3 + 2vl_1}{c-v}$$

(Triangle $N_1O_6N_6$ is right and isosceles)

Therefore time for traveling form N_5 to telescope by beam A` is equal to:

$$t'_1 = \frac{d_1+p_3}{c} + \frac{p_4}{c-v}$$

Beam B emits form N_5 toward mirror M (Figure 14). This path lays on the direction of motion, so the path of light motion in round trip will be parallel and has no aberration. We have:

$$t'_2 = \frac{d_2}{c-v} + \frac{l_2+l_4}{c+v}$$

Owing to aberration positions of interfering beams in telescope shift which can be computed as follow:

Distance between beams A` and B` is equal t:

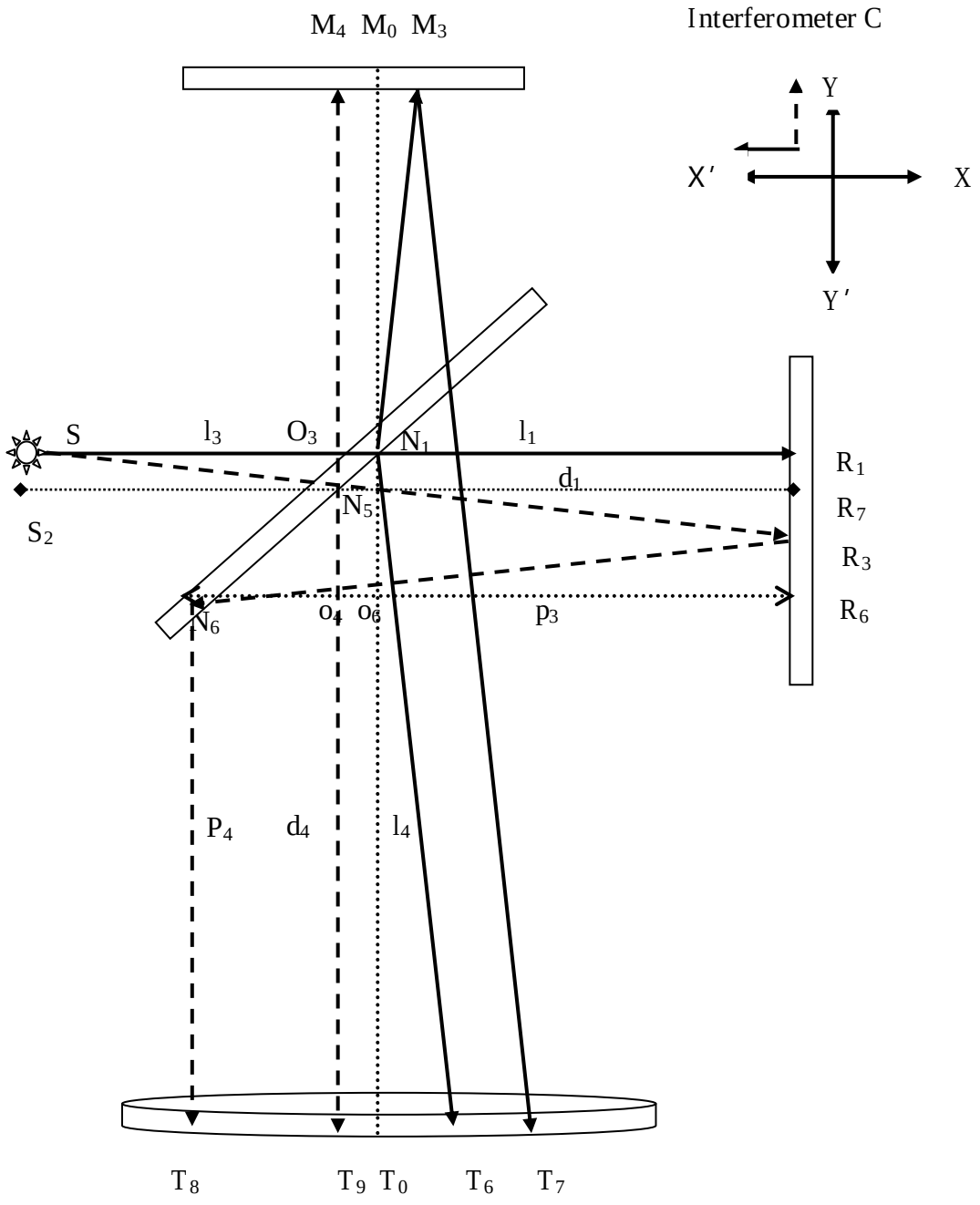
$$\nabla' = \frac{vl_3+2vl_1}{c-v} + \frac{vl_4}{c}$$

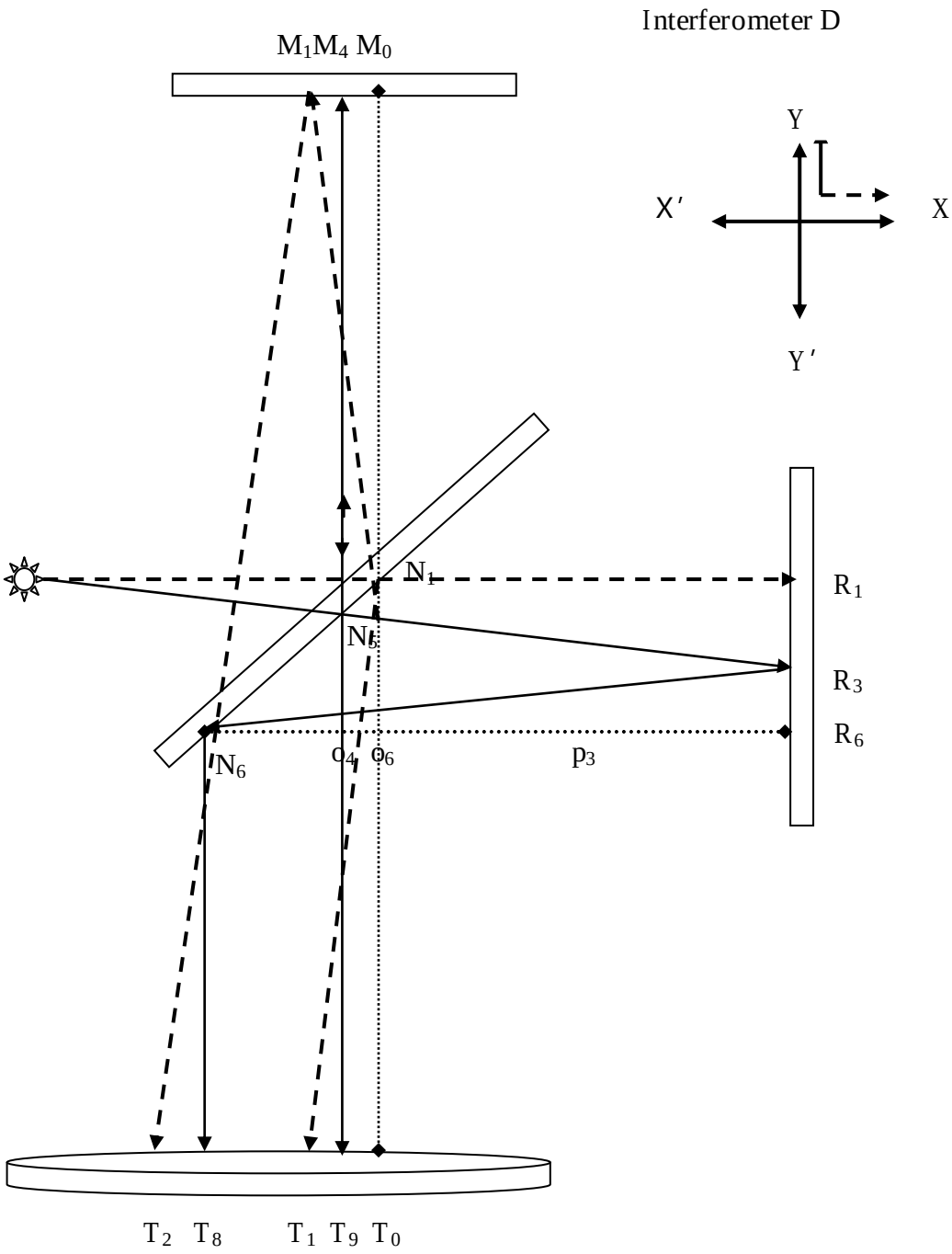
Change in position of beam A, shifted toward A`, in telescope is equal to:

$$\aleph_A = v\frac{(vl_3+2vl_1)}{c-v} + \frac{vl_4}{c}$$

The whole transposition of beam B toward B` caused by 90^0 rotation of apparatus is:

$$\aleph_B = v\frac{(2l_2+l_4)}{c} + \frac{vl_3}{c-v}$$


M4 M0 M3
Interferometer C
Y
X′
X
Y′
S
l3
O3
N1
l1
R1
d1
R7
N5
S2
R3
N6
o4
o6
p3
R6
P4
d4
l4
T8
T9
T0
T6
T7


Interferometer D
M1M4 M0
Y
X′
X
Y′
N1
N5
N6
R1
R3
R6
o4 o6
p3
T2 T8 T1 T9 T0

Interferometer D

Case of interferometer D is similar of interferometer C. The only different is that interferometer has rotated and now X axis of apparatus coordinate system has laid in the direction of motion. (Stage 1 of interferometer D is equal to stage 2 in interferometer C)

Stage 1: the Y axis of apparatus coordinates system lays in the direction of motion. Now apparatus starts 90^0 rotation counter clock wise. The X axis of coordinate system lays in the direction of motion and Y axis lays perpendicular to the direction of motion (Figure 13). Thus light aberration will occur in the opposite to what occurred in interferometer C and toward Y axis of apparatus coordinate system. So we have:

$$t_A = \frac{d_1 + p_3}{c} + \frac{p_4}{c-v}$$

$$t_B = \frac{d_2}{c-v} + \frac{l_2 + l_4}{c+v} \quad 0786239259$$

Distance between A and B is:

$$\nabla' = 2\frac{vl_3 + 2vl_1}{c-v} - \frac{vl_3}{c+v}$$

In stage 2, after the 90^0 rotation we have:

$$t'_A = \frac{l_1}{c-v} + \frac{l_1}{c+v} + \frac{l_4}{c} = \frac{2l_1}{c}\frac{1}{1-v^2/c^2} + l_4/c$$

$$t'_B = \frac{l_2}{c} + \frac{l_2 + l_4}{c} = 2\frac{l_2}{c} + \frac{l_4}{c}$$

Distance between A` and B` is:

$$\nabla' = 2\frac{vl_2}{c}$$

The whole deviation of beam A caused by aberration is:

$$\aleph_{A'} = v\frac{l_3 + 2l_1}{c-v} - \frac{vl_4}{c}$$

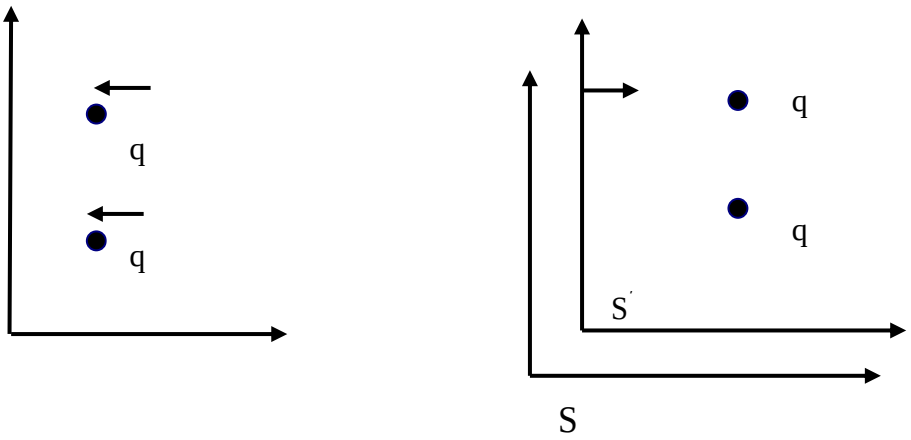
The whole transposition of beam B caused by 90^0 rotation of apparatus is:

$$\aleph_{B'} = v\frac{(2l_2 + l_4)}{c} - \frac{vl_3}{c+v}$$

Relativity and Electrodynamics

If the Michelson-Morley was not the reason for writing of the theory of relativity by Einstein, So what was the reason? The answer of this question lies on this fact that Maxwell equations contrary to Newton`s equation are not invariable. This issue compels that there should be an absolute preferred frame of reference in the universe that means a preferred frame of reference which Maxwell laws can be hold in it. It seems these laws are pervasive on the earth.

This variability of field equation experimentally appears in behavior of motionless and moving charged particles. Suppose there are two charged particles which distance between them are d and are motionless relative to each other and relative to their frame of reference (Figure 16 A). The repulsive force between these two particles is a measurable quantity that can be determined by coulomb`s laws. Assume that an observer that moves with speed u perpendicular to the connector line of these two particles. This observer assume that there are two charged particles which distance between them are d and are moving by speed –u relative to him. But every moving charge corresponds to an electric current, consequently these two charges not only exert a coulomb`s force to each other, but they exert an attraction force to each other which is relevant to their speed relative to each other and relative to the observer.



In other word observers in different inertial frame of reference measure different forces between to equal charges.

From Einstein viewpoint this paradox, is not related to validity of relativity principle as much as related to ether and its motion. The relativity principle is:

Relativity principle: The laws of nature are equal to all inertial frame of references.

Either we should discard this principle or the Maxwell equations are not correct or equation which by them we transfer physics laws from one inertial frame to another is not shown by Galilean transformation correctly.

The laboratory is physics′ tribunal. For acquitting or convicting some one there should be reliable witnesses and correct evidences which are valid empirical experiments.

We saw that some experiments like Michelson-Morley and therefore Kennedy-Torendic involved intrinsic deficiency and errors, so any deduction from these experiments are invalid. Thus theories which are based on these experiments are also invalid.

(Results of these experiments were key criteria for determining the validity of physics theories about space and time. Therefore that results of voluminous research for ether been gathered at Mount Wilson observatory in California USA where Michelson and Morley were working there. In this conference in addition to Michelson, Lorentz, Miller, Kennedy, some other scientists were also present. Finally because no theories could explain results of Michelson-Morley experiments, the Einstein theory of relativity was accepted by the conference.

According to previous chapters, we should choose those experiments as criterion which are empirically well-founded and have objectivity and strong logic. Because according to principle of simplicity; less factors result more certainty and more known factors results less doubt and risk. Therefore Aberration phenomena are more reliable than Michelson-Morley experiment to prove or disprove any theory. According to these phenomena light travels only by speed C relative to preferred frame of reference. Speed of light is different in different inertial frame of reference and it can be measured by Galilean transformation relative to the earth. This conclusion will lead us to amended Lorentz electrodynamics.

Amended Lorentz Electrodynamics

The Lorentz theory accepts the prior existence of stationary ether. Thus it proves whenever first degree of β is considered all electromagnetic and optical phenomena are dependent to their transitional motions. So this theory can explain all known issues, specially this fact that motion of earth by first degree of β can not be indentified. Lorentz also proposed the length contraction.

Length contraction as a physical effect on bodies composed of atoms held together by electromagnetic forces was proposed independently by George Fitzgerald[1] and by Hendrik Lorentz [2]. The following quote from Joseph Larmor is indicative of the pre-Relativity view of the effect as a consequence of James Clerk Maxwell`s electromagnetic theory:

"... if the internal forces of a material system arise wholly from electromagnetic actions between the system of electrons which constitute the atoms, then the effect of imparting to a steady material system a uniform velocity of transition is to produce a uniform contraction of the system

in the direction of motion, of amount $\sqrt{1-v^2/c^2}$ ".

By accepting this concept that all forces are subjected to the same equilibrium laws, we can extend Lorentz contraction to the other forces also. (Gravitation force electromagnetic and therefore for weak forces in electro-weak)

The fact which causes Lorentz contraction has root in an important principle of physical science that no one has been paid real attention to it till now. It is **principle of relativity of Force and Energy Effects**.

Now Amended Lorentz theory includes **principle of relativity of Force and Energy Effects.**

By keeping stationary ether this theory can explain 10 out of 13 important old and new experiments which were criteria for accepting or rejecting any theory. The remaining 3 experiments which are Michelson-Morley, Kennedy-Torendic and Michelson-Morley by using sun light involved some mistakes like Aberration mistake and have no validity.

(There has been recent controversy because of a 1998 claim by Corneille to have observed a positive result in the Trouton-Noble experiment, contradicting both relativity and the other experiments of this nature. This remarkable claim has not been subsequently replicated. Wikipedia)

Velocimeter

One of important known fact about light is its aberration which exactly identify and determines the motion of earth relative to the sun and also it`s other motion. By using this important factor we can make a velocimeter which is described as below.

We put a light source on one side of a pipe which creates tiny light beam (laser beam). (Figure 17) on the other end of pipe we put a light sensitive plate which can show where the light beam hits it precisely.

Consider the velocimeter is laid on the laboratory (its length lays parallel to the earth`s motion), so the path of light beam on the velocimeter will be straight and will have no aberration.

Then we turn the velocimeter 90^0 and velocimeter stand vertically relative to the laboratory surface (vertical to the earth`s motion).Figure 17. In this state according to aberration light beam slants with angle B and the hit point of light beam in the lower plate transfers by $RR` = d = vl/c$ also the time needed for to travel changes from $t_1 = \frac{l}{c \pm v}$ to $t_2 = \frac{l}{c}$. Know after determining the l and c precisely we can find v accurately.

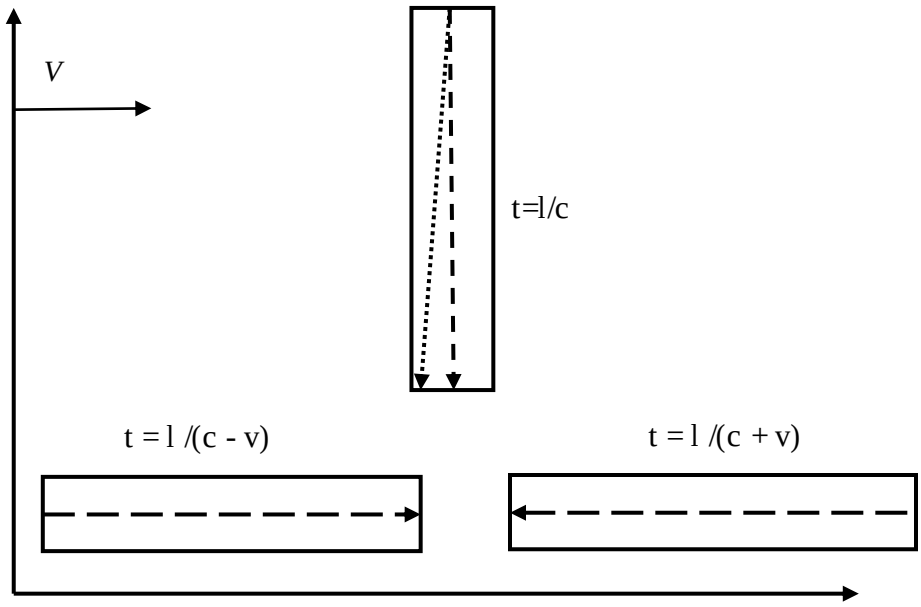
Assume velocimeter is motionless in a stationary laboratory in the earth`s surface. The length of

pipe is 10 meters, so magnitude of aberration in a 90^0 rotation will be equal to:

$$d = \frac{vl}{c} = \frac{30km/s * 10m}{3*10^5 km/s} = \frac{1}{1000}\ m$$

So aberration will be equal to 1 mm.

Suppose we are motionless relative an inertial frame of reference and have no any information about the motion of our frame of reference relative to sun in our solar system. By turning velocimeter 180 degrees in XX`, YY` and ZZ` and other directions we can find the maximum difference between two hit points of velocimeter light beam. (Also by measuring time necessary for light beam to travel in different direction) By identifying these two points we can find the path of motion (if exists). By using this velocimeter along the Doppler velocimeter we can find the magnitude of either observer or light source velocity exactly and this will terminate the fiction of relativity of motion.



Restriction in measuring Force and Energy

Measurement is the base of physical science. "Measurement has much importance especially in engineering and scientific researches. The result of measurement in an experiment often answers to the propounded question, and create ability of choosing the new theory or new branch of science. Thus measurement of light speed in different environment facilitates the evolution of wave theory. Efforts for measuring the absolute velocity of earth ended to creation of theory of relativity and measurement of energy distribution in black spectra concluded to creation of Quantum theory.

Concerning the importance of measurement, now consider the measurement procedures of force and energy concisely.

Aside of measurement procedure, every measurement is comparing magnitude of one quantity with magnitude of another quantity, which is determined as Unit.

The international system (SI) of units defines seven SI base units. physical units defined by an operational definition.

Meter, kilogram, second, ampere, Kelvin, mol, candela

All other physical units can be derived from these base units; these are known as SI derived units.

Force and energy units are SI derived units which is defined as below:

A *Newton* is the amount of force required to accelerate a body with a mass of one kilogram at a rate of one meter per second squared. (In standard condition of STP)

The dyne is a unit of force specified in the *centimeter-gram-second* (cgs) system of units. One dyne is equal to exactly 10^{-5} Newtons. Further, the dyne can be defined as "the force required to accelerate a mass of one gram at a rate of one centimeter per second squared."

One joule is the work done, or energy expended, by a force of one Newton moving an object one meter along the direction of the force. This quantity is also denoted as a Newton-meter with the symbol. $J = l\ N \cdot m$.

The erg is a small unit, equal to a force of one dyne exerted for a distance of one centimeter. In the CGS base units, it is equal to one gram centimeter-squared per second squared ($g \cdot cm^2/s^2$). It is thus equal to 1×10^{-7} joules or 0.1 micro joules (μJ) in SI units.

The ampere is a constant current which, if maintained in two straight parallel conductors of infinite length, of negligible circular cross section, and placed 1 meter apart in a vacuum, would produce between these conductors a force equal to 2×10^{-7} Newton per meter of length.

The volt (symbol: V) is the SI derived unit of electric potential difference or electromotive force

The volt is defined as the potential difference across a conductor when a current of one ampere dissipates one watt of power. Hence, it is the base SI representation $m^2 \cdot kg \cdot s^{-3} \cdot A^{-1}$, which can be equally represented as one joule of energy per coulomb of charge, 1v= J/C.

The electron volt (symbol ev) is a unit of energy. In theoretical physics, where distinctions between mass and energy are not concrete, it is often used also as a unit of mass (AAAS Science journal, 2006). It is the amount of kinetic energy gained by a single unbound electron when it passes through an electrostatic potential difference of one volt, in vacuum. In other words, it is equal to one volt (1 volt = 1 joule per coulomb) times the (unsigned) charge of a single electron $e_v = m_e v^2/2$

By studying all standard units of force and energy and some other related units we can see all these units are based on Newton (Force unit) or quite similar definition like dyne, kilogram force. So we can say definition of Newton is the foundation for all other force and energy measurements. (Thus if Newton`s definition has some deficiency or limitation, all other units and measurements, also carry that deficiency and limitation.)

Newton`s definition:

A *Newton* is the amount of force required to accelerate a body with a mass of one kilogram at a rate of one meter per second squared in a laboratory in standard condition. Algebraically:

$$1\ \mathrm{N} = 1\ \frac{\mathrm{kg} \cdot \mathrm{m}}{\mathrm{s}^2}.$$

That definition has said nothing about the force characteristics, velocity of force effects and transition, and continuity or discontinuity of force nature.

In that definition has been said that the force which causes a stationary standard object of 1 K g to accelerate 1 m/s^2 is 1 N. The measured force of 1 N can accelerate the standard object to a = 1 m/s^2, Now The question is whether this force can accelerate the standard object when it is moving at speed v = 10m/s again a = $1m/s^2$ and by that standard object can it be measured 1 N.

In another word is that measured force of 1 N an absolute quantity; and on all other moving objects will have effect as 1 N; and all moving objects will measure it and respond as 1 N.

If no, how we can expect that the moving object respond to it according to 1 N (Newton`s third law of motion) and the force effects should be equal to those effects on the stationary state. If no, how we can apply force laws on the moving bodies.

Surely it is a relative quantity that each moving object will measure and respond to it differently. Answer to this question will change the concept and definition of force.

Preferred Frame of Reference

Twin paradox

In his famous work on Special Relativity in 1905, Albert Einstein predicted that when two clocks were brought together and synchronized, then one was moved away and brought back, the clock which had undergone the traveling would be found to be lagging behind the clock which had stayed put. Einstein considered this to be a natural consequence of Special Relativity, not a paradox

In 1911, Paul Langevin made this concept more vivid and comprehensible by his now-iconic story / thought experiment of the twins, one of whom is an astronaut and the other a homebody. The astronaut brother undertakes a long space journey in a rocket moving at almost the speed of light, while the other remains on Earth. When the traveling brother finally returns to Earth, it is discovered that he is younger than his sibling, that is to say, if the brothers had been carrying the clocks mentioned above, the astronaut`s clock would be found to be lagging behind the clock which had stayed with the Earth-bound brother, meaning that less time had elapsed for the astronaut than for the other. Langevin explained the different aging rates as follows: "Only the traveler has undergone an acceleration that changed the direction of his velocity". According to Langevin, acceleration is here "absolute", in the sense that it is the cause of the asymmetry (and not of the aging itself).

It should be stressed that neither Einstein nor Langevin considered such results to be literally paradoxical: Einstein only called it "peculiar" while Langevin presented it as evidence for absolute motion. A paradox in logical and scientific usage refers to results which are inherently contradictory, that is, logically impossible, and both men argued that the time differential illustrated by the story of the twins was an entirely natural and explainable phenomenon.

Quintuplet phenomenon

Using the Twin paradox which is phenomenon based on Relativity of Force and Energy effects we can extend the twin paradox to quintuplet phenomenon as follow:

Suppose there are 5 quintuplet brothers (instead of twin) living on the earth. These quintuplet brothers A, B, C, D and E are quite similar. Four brothers are astronauts and every one has one spaceship and one remains stationary on the earth.

Every astronaut undertakes a long space journey in his own spaceship moving at high speed, every one travels at his own space ship with different speed. Spaceships with different speeds of V_B, V_C, V_D, and V_E travel different distance of D_B, D_C, D_D and D_E in equal time but in opposite direction.

When the traveling brothers finally return to Earth, it is discovered that they are younger than

their homebody brother. According to A`s clock (stationary) all brothers lift the earth at once and returned home simultaneously. Observer A sees that during this common trip he aged 20 years, voyager B aged 15 years, voyager C aged 10 years and voyager D aged 5 years and he didn`t meet voyager E yet (he is eating his breakfast !!!), so he doesn`t know his age.

The astronauts` clocks would be found to be lagging behind the clock which had stayed with the Earth-bound brother, meaning that less time had elapsed for the astronauts than for the other.

For each voyager this difference is equal to:

$$T = T_0 / \sqrt{1 - v^2/c^2}$$

Which T is time measured by each passenger and v is its spaceship speed and T_0 is time measured by stationary brother.

According to Max born: "This equation is valid for every moment of motion, because the leaving and returning occur at same speed, so this equation is valid especially for the time of changing direction, thus T_0 is time of all motion according to proper time of stationary observer A, and T is all motion time according to proper time of observer B. when v<<c the above mentioned equation can be written as:

$$T = T_0 \left[1 + \frac{1}{2}\frac{v^2}{c^2}\right]$$

Therefore the A`s clock at the moment that B ends his journey is preceding B`s clock by

$$T - T_0 = \frac{v^2}{c^2}\frac{T_0}{2} \quad "$$

But traveling brothers see another peculiar phenomenon. The traveling brothers` ages are also different with each other, and one can see either he is younger or older than other one, but why?

All traveler had undergone an acceleration that changed the direction of their velocity, so all of them passed the same situation and same condition and they should be equivalent; means same age and same condition.

For example voyager C sees he is younger than B and older than D, and he is not sure whether he is older or younger than E. (what do you think?)

In order to understand this difference he appeal to Professor Einstein and open his relativity book.

By opening the relativity book he sees one of two principles which relativity is based on them:

The laws of nature are equal in all inertial frame of reference.

(Postulate: the principle of relativity is valid about all natural events.)

The voyager C thinks he and his brothers at 99% of trip time were in inertial frame and equal to other voyagers and stationary brother, and a few moments of start and end and changing direction of motion which comprise less than 1% of trip time that they had acceleration. But even in acceleration time the voyagers all had similar conditions.

But according to the twin paradox, time difference and dilation is valid for all time of motion whether he was on accelerated frame or he was on inertial frame with uniform linear motion; which contradicts theory of relativity.

Anyhow by using this self-contradictory and controversial explanation, he can explain and compute the difference between his age and age of stationary A.

Another dilemma is the difference between his age and ages of other voyagers. Why this difference happens and how can be explained and measured?

According to the Newton first law of motion acceleration is not an intrinsic characteristic of any object. It is caused by an external force. When ever this external force is exerting, object gets acceleration and act as an accelerated object subject to acceleration laws of motion. When external forces disappear, the object loses his acceleration and continues with uniform linear motion subject to the inertial laws of physics and become an inertial frame.

At 99% of time they were at inertial frame with uniform linear motion so on that time they were subject to inertial laws of physics and have no characteristics of accelerated object, and at 1% of travel time they had acceleration subject to the acceleration laws of motion.

Can he apply twin paradox for this issue also? (Like what he did with stationary A)

At 99% of time they were completely equal in same situation and in remaining 1% of time (acceleration time) both were in accelerated frame, thus at all time of journey they were exactly at same situation subject to the same laws, so they absolutely were equal. The relative velocity of each passenger was equal to the relative velocity of that passenger relative to the first one. It means the relative speed of every two passenger relative to each other was equal. All voyagers claim equality and same condition and laws so nothing can differentiate between these people, even professor Einstein, and there will be no asymmetry and dissimilarity stated by any theory.

Nevertheless they have different travel time or age, so they refer problem to the professor Lorentz and his theory. According to Lorentz, length contraction is equivalent to the time dilation in SR. length contraction only happens for those objects which are moving relative to the preferred frame of stationary A and only can calculated by speed (uniform linear motion) of that object relative to preferred frame of reference A as follow:

For each voyager this difference is equal to:

$T = T_0 / \sqrt{1 - v^2/c^2}$ Equivalent to: $l = l_0\sqrt{1 - v^2/c^2}$

Which l is distance measured by each passenger and v is its spaceship speed relative to the preferred frame of A, and l_0 is distance measured by stationary brother

(According to Max born: Strange phenomenon which demonstrated by

$T = T_0 / \sqrt{1 - v^2/c^2}$ Can be composed in another way and that is by using Lorentz contraction. In fact in a way that spaceship passenger measure distance l. This distance according to Lorentz laws is: $l = l_0\sqrt{1 - v^2/c^2}$ where v is the speed of spaceship relative to the stationary A.

By accepting Lorentz theory, voyager C can determine travel time and age of all his quintuplet brothers precisely and accurately without any contradiction. He can also anticipate any other action`s result and the anticipation will be accurate.

In final conclusion he and all quintuplet brothers accept that among numerous inertial frames of references which have relative motion, one and only one inertial frame can be regarded as preferred frame of reference, and time dilation or length contraction only can happen and be measured by motion relative to this preferred frame of reference. This is what scientists were searching about at the beginning of 20`Th century.

General Relativity

General theory of relativity involves the Accelerated frame that is based on space-time continuum, and curvature of space-time under the gravitation force. In the following chapter I want to discuss them briefly.

Equivalence principle (Inertial mass and gravitational mass)

Inertia and Centrifugal Force

Inertia is only about the momentum conservation law. In momentum conservation law when ever two things collide then the sum of momentum before the collision and after collision will be equal. Thus in order to change the momentum of any object there should be external object or force acting on that object in order to change the momentum.

According to momentum conservation law, if there is no external force then there will be no change in momentum and that is the Newton`s first law of physics. So Inertia is only about the momentum conservation law and it has no relation with celestial bodies and no need to invoke other objects.

Centrifugal forces are also due to same phenomena. We know that centrifugal force only come to exist when there is a circular motion around a center. Circular motion is an accelerated motion which need force to continue acceleration. Centrifugal force has nothing with absolute or relative rotation. It is only the result of force you exert to keep it accelerated. In another word the force you exert to keep object rotating and so accelerating cause the centrifugal forces.

Newton tried to demonstrate that one if he is rotating with respect to the absolute space, can measure the apparent forces that arise only when an absolute rotation is performed. If a bucket is filled with water, and made to rotate, initially the water remains still, but then, gradually, the walls of the vessel communicate their motion to the water, making it curve and climb up the borders of the bucket, because of the centrifugal forces produced by the rotation. Newton says that this experiment demonstrates that the centrifugal forces arise only when the water is in rotation with respect to the absolute space (represented here by the reference frame solidly with the earth, or better, the distant stars); instead, when the bucket was rotating with respect to the water no centrifugal forces were produced, this indicating that the latter was still with respect to the absolute space.

Equivalence principle

Albert Einstein asserts that the gravitational "force" as experienced locally while standing on a massive body (such as the Earth) is actually the same as the pseudo-force experienced by an observer in a non-inertial (accelerated) frame of reference.

The equivalence principle was introduced by Albert Einstein in 1907, when he observed that the acceleration of bodies towards the center of the Earth at a rate of 1g (g = 9.81 m/s^2 being the acceleration of gravity at the Earth`s surface) is equivalent to the acceleration of an inertial moving body that would be observed on a rocket in free space being accelerated at a rate of 1g. Einstein stated it thus:

"We [...] assume the complete physical equivalence of a gravitational field and a corresponding acceleration of the reference system." (Einstein 1907)

. From this principle, Einstein deduced that free-fall is actually inertial motion. By contrast, in Newtonian mechanics, gravity is assumed to be a force. This force draws objects having mass towards the center of any massive body. At the Earth`s surface, the force of gravity is counteracted by the mechanical resistance of the Earth`s surface. So in Newtonian physics, a person at rest on the surface of a (non-rotating) massive object is in an inertial frame of

reference. While this picture works very well for most calculations, the inertial mass in Newton`s second law, $F = ma$, mysteriously equals the gravitational mass in Newton`s law of universal gravitation. Under the equivalence principle, this mystery is solved because gravity is an acceleration from inertial motion caused by the mechanical resistance of the Earth`s surface. These considerations suggest the following corollary to the equivalence principle, which Einstein

Einstein also referred to two reference frames, K` and K. K is a uniform gravitational field, whereas K` has no gravitational field but is uniformly accelerated such that objects in the two frames experience identical forces:

"We arrive at a very satisfactory interpretation of this law of experience, if we assume that the systems K and K` are physically exactly equivalent, that is, if we assume that we may just as well regard the system K as being in a space free from gravitational fields, if we then regard K as uniformly accelerated. This assumption of exact physical equivalence makes it impossible for us to speak of the absolute acceleration of the system of reference, just as the usual theory of relativity forbids us to talk of the absolute velocity of a system; and it makes the equal falling of all bodies in a gravitational field seem a matter of course." (Einstein 1911)

This observation was the start of a process that culminated in general relativity. Einstein suggested that it should be elevated to the status of a general principle when constructing his theory of relativity:

"As long as we restrict ourselves to purely mechanical processes in the realm where Newton`s mechanics holds sway, we are certain of the equivalence of the systems K and K`. But this view of ours will not have any deeper significance unless the systems K and K` are equivalent with respect to all physical processes, that is, unless the laws of nature with respect to K are in entire agreement with those with respect to K`. By assuming this to be so, we arrive at a principle which, if it is really true, has great heuristic importance. For by theoretical consideration of processes which take place relatively to a system of reference with uniform acceleration, we obtain information as to the career of processes in a homogeneous gravitational field." (Einstein 1911)

Einstein combined the equivalence principle with special relativity to predict that clocks run at different rates in a gravitational potential, and light rays bend in a gravitational field, even before he developed the concept of curved space-time. It is important to note that any accelerated frame of reference has a gravitational potential associated with it. Therefore clocks displaced in the direction of acceleration with respect to an accelerating rocket will be found to be going faster or slower by the observer in the accelerating rocket in accord with gravitational time dilation. The same applies to other gravitational effects such as gravitational red shifting and the bending of light.

Despite the Relativity theory there are many evidences which help us to differentiate between K and K` flying by acceleration and stationary on the earth surface.

With the modern development of accelerators and intense beams of charged particles, the electric conductor is no longer necessary to observe this phenomenon and the interaction of independent electric charges in the magnetic field generated by commoving electric charges has been observed directly. In fact, the magnetic field produced by commoving electric charges produces a focusing that reduces the dispersion of the beam of particles. One can clearly observe particles all having the same velocity in a parallel beam attracting each other due to the magnetic field produced by the velocity of the neighboring charges.

Let us now consider an observer moving with that beam of particles. In his frame of reference, the particles appear stationary with respect to him. Then, no magnetic field is produced. Using Einstein`s principle of reciprocity within that moving frame, the charged particles should repel each other according to the electrostatic repulsion of charges having the same polarity. However, they attract each other as calculated above and observed experimentally. This is clearly not acceptable.

Other experiments involving Maxwell`s equations exist which are not compatible with the reciprocity principle. However, the ones described above suffice to disprove this principle.

The light aberration is precise experiment for differentiating between the frame K which is in a uniform gravitational field, and K` is not in a gravitational field but is uniformly accelerated

The aberration magnitude in inertial frame it is constant. The only effect of gravitation on light is bending its path and changing its direction; but in a accelerated frame like earth with circular motion is nearly constant (because the earth`s orbit is too long the motion of earth in its orbit is near a linear motion), it fluctuates between to limits and never exceed a specified limit. In linear acceleration the magnitude of aberration continuously increases or decrease and the angle θ of aberration can have a magnitude of 90 to 0 degree which shows speed between 0 and nearly c. (the light of stars which are above the head)

Maxwell equations which aren't invariant under Galileo's transformations also can detect difference between K and K'. This difference is revealed by the different behavior of stationary and moving charged particles in the field equation empirically. For example a stationary electric charge in the accelerated space craft also has acceleration. And according to electromagnetic laws this charge radiates, but stationary charges on the earth's surface don't do that.

There are other effects like Michelson - gill experiment, Signac effect which show the effect of rotating frame which is an accelerated frame.

You see that there are many effects and experiments which can help us to differentiate between accelerated frames and gravitational frames of reference.

Space-time Continuum

One of important pillar of theory of relativity is space-time continuum and considering time as forth dimension in hypothetic world called Minkowski world.

No concisely we review the cause of its creation, tangible appearance, its effects and outcome.

The wrong space-time continuum hypothesis is created from composition of the following wrong issues:

Considering that time is a flow which continually passes us, or a dimension which we are moving in it.

The principle of light speed constancy

The principle of relativity of simultaneity

Previously I mentioned that perceptions like time passes things, or things are moving in time dimension only are created by our imagination. Such these perceptions have no scientific or sensible bases. Also empirical knowledge of time and space and motion refute them. We have seen that experiments show that speed of light only relative to the preferred frame of reference is equal to c, so the principle of light speed constancy is invalid and finally we have seen that simultaneity is an absolute phenomenon which can be measured accurately.

Concerning the above mentioned issues, it is obvious that the reasons which created the space-time continuum are incorrect and contrary to experiments. Therefore their result such as space-time continuum, Minkowski`s world and the forth dimension are also invalid.

The empirical appearance and experimental presentation

According to the relativists, space-time continuum originally has no (physical or experimental) structure and they have no perception of the forth dimension and Minkowski`s world. In an explanation about it Max born says: "may be this world like a plane in our three dimensional space is located in a four dimensional space and all lengths change due to unknown forces in specified parts of that spaces, and this change was never perceivable for us."

We saw that space-time continuum has no physical structure, unperceivable, and insensible, thus the space-time and curvature of space-time continuum are fictions.

Consequence of space-time continuum

According to Lois Epstein time and space are the foundation of physics. Time and space are laid in all branches of physics (mechanics, thermodynamic ... optics) but only in one branch of physics, optics there was a problem, not in all optics but in speed of light... Einstein victory (its theory of space-time) cost ten thousands violations.

Einstein`s mass–energy equivalence

It was derived by Einstein (1905) as a consequence of the relativity principle, that inertia of energy is actually represented by E/c^2, but in contrast to Poincaré`s 1900-paper Einstein recognized, that matter itself loses or gain mass during the emission or absorption by E/c^2. So the mass of any form of matter is equal to a certain amount of energy, which can be converted into and re-converted from other forms of energy. This is the mass–energy equivalence, represented by $E=mc^2$. According to Darrigol, Poincare`s radiation paradoxes can simply be solved by applying Einstein`s equivalence, i.e. if the light source loses mass during the emission by E/c^2, the contradiction in the momentum law vanishes.

Max born in his book Einstein`s theory of relativity says: the only meaning of mass in physics is m=p/v or its inertia.

When an object looses energy it looses a part of its mass also and when it gets energy it gets energy it gets mass also. It is better to say the mass which the particle loose or get carried by energy and the inertia which energy has is from the mass that it carries. Inertia is the physical definition of mass. Thus mass has not been converted to energy or energy has not been converted to mass but they transmit along each other and they are companion of each other. The mass which disappears during emission or absorption is not converted to energy but the freed energy takeout this mass with itself when this energy absorbed by another particle, the carried mass is also absorbed by that particle.

Concerning the refutation of theory of relativity the Einstein hypothesis of mass energy also disproves.

Relativity of Force-Energy effects

Explanation of black body radiation by Plank and photo-electric phenomenon by Einstein showed that the classical force concept is imperfect and should be substitute with perfect one.

According to Quantum theory, forces (for fundamental forces) are transmitted by separate particles in quanta at a finite speed.

According to modern theory, forces and energy are transmitted by the speed of c. This means that any turmoil in sun gravitational force will be transferred by a finite speed v, and after time equal to $t = l/v$ we can feel it. The realistic and empirical idea is that all these forces have speed of c relative to preferred frame of reference which was detected during past experience and

Electromagnetic force and therefore weak force (in Electro-weak theory) and gravitation force in the universe prove it.

The important point is that the retard theory is formed to counter the instantaneous theory which has no physical reason and justification. It is statement in the theory of relativity only to emphasize the superior importance of c over all aspects of the world and show speed of nothing in the world can reach or exceed c, and they didn`t state and didn`t study the speed of force and energy transmittance as an individual principle which has many consequences.

Now we study concisely effects of speed of force transition on its influence.

It is proven that forces transmitted by quanta at speed of c. Based on this principle we found the following thought experiment which is simulated to the real phenomena.

Considering sun as preferred frame of reference, suppose we have a station named E motionless relative to the sun. In this station we have a particle accelerator which can give high acceleration to particles by a powerful force generator.

The generator work with AC electric current turns on and off thousand times in second (because of AC electricity cycling). So the force or force field created by this generator initiates and cuts consequently.

In any electric cycle, particles carrying force (fundamental particles) or field of forces, are being made and disseminated through space by speed of c, like bullets of machine gun or sea waves attacking coast. Thus every particle behind the precedent and every wave before last one will move.

Based on the above mentioned phenomena it will take time $t = l/c$ for force particles or waves to hit and effect an object which has distance equal l from generator.

According to previous chapter the speed of force particles and extension of force field relative to moving bodies should be computed by classical addition of speeds.

Suppose there is an object b moving by speed of v relative to the generator (which is motionless relative to preferred frame of reference), when ever force particles or fields are created and then disseminated the speed of them relative to moving object by speed v (which has same direction with force particle or waves) are $c - v$.

When ever the speed of object approaches c, the speed of moving object relative to the generator reaches the speed of force particle or field relative to generator. Hence the speed of force particles or fields relative to the moving object b reaches the $c - c = 0$. So the force particles or fields can not reach the moving object, can`t affect and accelerate it more. It is out of force field effects.

In the above mentioned circumstances the object b is out of force field effects. So it can′t be more accelerated and therefore the speed of object can′t exceed c, and it remains near to c.

Particle A, with mass of m_0 is motionless in the accelerator. After experiment we understand that by exerting force F in time T, this particle gets high acceleration and its speed reaches to $v_0 = 0.9998c$ that approximately equals to $v_0 \cong c$. The classic momentum of this particle will be equal to $p_0 = m_0.c$ and thus its kinetic energy is $k_0 = m_0c^2/2$. Also the effective force on the particle (the force which has affected and created acceleration) is:

$$f = \frac{d}{dt}p_0 = \frac{d}{dt}(m_0.v_0) = \frac{d}{dt}\,m_0c$$

Now we insert particle A` which has motion with speed v relative to the generator. The direction of motion of particle A is parallel to the acceleration direction. Both particles are completely equal and similar to each other ($m = m_0$ ). Similar to the past experiment again we exert the same force F at time T on A` at the same direction parallel to the direction of motion of particle A.

According to our daily experiments on ordinary speeds and instantaneous theory we expect that increase in speed of particle A` should be equal to the increase in speed particle A (motionless) which was equal to c. It means speed of particle A` should change form v to $c + v$.

According to new physic theories force and energy transmit by speed equal to c and as previously being said as a result the speed of object can′t exceed c, and experiments confirm it.

Thus the speed of particle A` can`t exceed c and always remain near to c, close to the speed which particle A reached. It means after exerting force F on particle A` its speed approaches $v_0 = c$ therefore its momentum will reach the

$$p_1 = p_0 = mc = m_0v_0 = m_0c$$

and its kinetic energy approaches to:

$$k_1 = k_0 = mc^2/2$$

Before entering the accelerator the particle A` had motion by speed v and momentum $p` = mv$ and kinetic energy equal to $k` = 1/2\,mv^2$. So the real increase in its kinetic energy will be equal to:

$$k = k_0 - k^{'} = \frac{1}{2}\,mc^2 - \frac{1}{2}mv^2$$

$$= \frac{1}{2}m(c^2 - v^2) = \frac{1}{2}mc^2\left(\frac{c^2 - v^2}{c^2}\right) = k_0(1 - \frac{v^2}{c^2})$$

So:

$k = k_0(1 - \frac{v^2}{c^2})$ I

Based on the above formula we have:

$p = \sqrt{2mk}$ and $p_0 = \sqrt{2mk_0}$

$p = \sqrt{2mk_0(1 - v^2/c^2)} = p_0\sqrt{1 - v^2/c^2}$

So: $p = p_0\sqrt{1 - v^2/c^2}$

And $v'' = (v_0 = c)\sqrt{1 - v^2/c^2}$

k is the kinetic energy and p is the momentum and v`` is the speed which the moving particle A` have got in the accelerator under the exerted force f in time t (similar to force exerted on particle a) and therefore we have:

$k = k_0(1 - v^2/c^2) \rightarrow p = p_0\sqrt{1 - v^2/c^2}$

$p = p_0\sqrt{1 - v^2/c^2} \rightarrow mv'' = m(v_0 = c)\sqrt{1 - v^2/c^2}$

$v'' = (v_0 = c)\sqrt{1 - v^2/c^2}$ | $d = d_0\sqrt{1 - v^2/c^2}$

$t = \frac{t_0}{\sqrt{1 - \frac{v^2}{c^2}}}$

(V``=d/t is the increase in speed of particle A` in the accelerator)

Consequently we can compute the effective force acted on the particle A` in the accelerator:

$f = \frac{d}{dt}p = \frac{d}{dt}p_0\sqrt{1 - v^2/c^2}$

The reason of different effects of same force on two motionless particles A and moving particle A` is the principle of **relativity of force and energy effect** which states:

Forces have different effects on moving particle and motionless particle (relative to preferred frame of reference) which is proportion to their speed

Because different Forces and Energies transmit by disjointed quanta which travel at speed c; so the result of the above experiment is valid for all of them. Thus the principle of relativity of force

and energy effect is valid for all these forces and energies.

What ever have been said is the same with Relativity mechanics but by a difference in concept and philosophy. In this new idea we suppose that only energy and force and their effects are relative issues and time, space and mass are absolute matters, exactly counter wise to relativity concepts.

Relativity of Force and Energy Effects and SR

The relativity of force and energy theory (revised classical mechanics), and special relativity in most of aspects are the same and both describe most of phenomena similarly.

According to Relativity of force and energy effects (RFEE) principle, the force f has different effects on moving or stationary objects which is determined as:

$$f = \frac{d}{dt}p = \frac{d}{dt}p_0\sqrt{1 - v^2/c^2}$$

RFEE principle is the real reason of the following phenomenon:

A system composed of electric charges that only by its electrostatic force is in equilibrium, when the system start motion, automatically start contracting as well, in another word the electromagnetic forces contributing to the motion of system change the configuration of system in such a way that the length of object contracts by factor of $\sqrt{1 - v^2/c^2}$ in the direction of motion.

So the Lorentz length contraction and local time (virtual) is the consequence of RFEE principle.

In relativity there is no such RFEE principle so for explaining the experiment of accelerating twin particle which we mentioned before; relativity theory states:

According to relativity theory

Space, time, and mass are relative quantities, and motion through space-time continuum will change them (for other observer). These changes appear in the shape of length contraction, time dilation and mass increasing.

The result of accelerating particles in the above experiment is based on the frame you select. Every one of time dilation, length contraction and mass increasing can be the reason for the result deviation from classical mechanics.

According to relativity both A and A` have equal rest mass. But when particle A` start motion

and its speed reach v then its mass increases by:

$$m = \frac{m_0}{\sqrt{1-\frac{v^2}{c^2}}}$$

Relative to Accelerator frame of reference, so according to classical momentum conservation principle the force which exerted on the particle A` and change its momentum to $p_0 = m_0 c$ when that force is exerted on the particle by mass of $m = \frac{m_0}{\sqrt{1-\frac{v^2}{c^2}}}$ then it change its momentum to

$$p_0 = m_0 c = \left(m = \frac{m_0}{\sqrt{1-\frac{v^2}{c^2}}} \right) \left(v_0 \sqrt{1-\frac{v^2}{c^2}} \right) = m \left(v_0 \sqrt{1-\frac{v^2}{c^2}} \right)$$

And so its speed changes up to $v'' = v_0 \sqrt{1-\frac{v^2}{c^2}}$ in which $v_0 = c$. This explanation is completely correspondent to experiment and can anticipate the result very well.

So by considering $m = \frac{m_0}{\sqrt{1-\frac{v^2}{c^2}}}$ we can keep conservation of momentum nominally, but reality is that the change in momentum of particle A` is not equal to $p_0 = m_0 c$ but it is

$$p = p_0 \sqrt{1-\frac{v^2}{c^2}} = m_0 v_0 \sqrt{1-\frac{v^2}{c^2}}$$

In fact no mass has increased but the force has decreased.

The particle accelerating can also be explained by time dilation and length contraction.

According to laboratory observer which is at rest relative to accelerator frame of reference, because of motion, time for moving particle A` slows and its clock ticks slowly. So time which observer measure equal to t_0 for the moving particle will be equal to $t = \frac{t_0}{\sqrt{1-\frac{v^2}{c^2}}}$.

Again we will have:

$$m_0 \left(v'' = \frac{d_0}{t = \frac{t_0}{\sqrt{1-\frac{v^2}{c^2}}}} \right) = m_0 \frac{d_0}{t_0} \sqrt{1-\frac{v^2}{c^2}} = m_0 v_0 \sqrt{1-\frac{v^2}{c^2}}$$

The $p = m_0 v_0 \sqrt{1-\frac{v^2}{c^2}} = p_0 \sqrt{1-\frac{v^2}{c^2}}$ is the real change in momentum of moving particle after

exerting force f in accelerator which is correspondent to the result of experiment.

At the same manner the length contraction can also be the reason of the result deviation from classical mechanics:

According to laboratory observer which is at rest relative to accelerator frame of reference, because of motion, length for moving particle A` contracts. So length which observer measure equal to l_0 for the moving particle will be equal to $l = l_0\sqrt{1-\frac{v^2}{c^2}}$ .Again we will have

$$m_0\left(v'' = \frac{d_0}{t_0}\right) = m_0\frac{l=l_0\sqrt{1-\frac{v^2}{c^2}}}{t_0} = m_0\frac{d_0}{t_0}\sqrt{1-\frac{v^2}{c^2}} = m_0 v_0\sqrt{1-\frac{v^2}{c^2}}$$

In which $v'' = v_0\sqrt{1-\frac{v^2}{c^2}}$ and $v_0 = c$

The $p = m_0 v_0\sqrt{1-\frac{v^2}{c^2}} = p_0\sqrt{1-\frac{v^2}{c^2}}$ is the real change in momentum of moving particle after exerting force F in accelerator which is correspondent to the result of experiment

Thus we have:

$$d = d_0\sqrt{1-\frac{v^2}{c^2}} \quad \Longleftrightarrow \quad v'' = v_0\sqrt{1-\frac{v^2}{c^2}}$$

$$t = t_0/\sqrt{1-\frac{v^2}{c^2}} \quad \Longleftrightarrow \quad v'' = v_0\sqrt{1-\frac{v^2}{c^2}}$$

$$p = \left(m = \frac{m_0}{\sqrt{1-\frac{v^2}{c^2}}}\right)\left(v_0\sqrt{1-\frac{v^2}{c^2}}\right) \quad \Longleftrightarrow \quad v'' = v_0\sqrt{1-\frac{v^2}{c^2}}$$

$$v'' = v_0\sqrt{1-\frac{v^2}{c^2}} \quad \Longleftrightarrow \quad p = p_0\sqrt{1-\ v^2/c^2}$$

$$p = p_0\sqrt{1-\ v^2/c^2} \quad \Longleftrightarrow \quad f = \frac{d}{dt}p = \frac{d}{dt}p_0\sqrt{1-\ v^2/c^2}$$

As you know the formula $f = \frac{d}{dt}p = \frac{d}{dt}p_0\sqrt{1-\ v^2/c^2}$ is the formula of Relativity of force and energy effects principle.

Let see the muons example:

The life time of stationary muons has difference with moving muons lifetime. This difference is equal to $t = t_0/\sqrt{1-\frac{v^2}{c^2}}$ in which the t is the life time of moving muons and the lifetime of stationary muons is t_0 . It means the moving muons are decayed by force of f acted at time of t; Also the stationary muons are decayed by force f acted at time t_0.

By RFEE principle we can say simply that the stationary muons can be decayed by force of f acted at time t_0, so when the muons are in motion the decaying force effect reduces from

$f = \frac{d}{dt}p_0$ to $f = \frac{d}{dt}p = \frac{d}{dt}p_0\sqrt{1-v^2/c^2}$.

Now by exerting relative force of $f = \frac{d}{dt}p = \frac{d}{dt}p_0\sqrt{1-v^2/c^2}$ in time of $t = t_0/\sqrt{1-\frac{v^2}{c^2}}$ we can have muons decayed. (A definite amount of force to be acted at a definite amount of time to have muons decayed. When the acting force decreases, the time of action of force should be increased to have the job done.)

It means from Relativity of force and energy effects principle we can derive all of time dilation, length contraction and mass increasing which are figurative and virtual effects. And from these virtual effects of time dilation, length contraction and mass increasing we can obtain the relativity of force and energy effect principle inversely. Thus the entire relativity theory can be derived from Relativity of force and energy effect principle except its controversial and paradoxical issues which have no physical foundation.

The end