Matter and Energy

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Abstract:
Equivalence of mass and energy relation can be proved by Newtonian mechanics. The law of conservation of energy necessitates to assume that when the body moves increase in mass of the body is real so total energy of the body measured by all observers is same irrespective of their state of motion. Second postulate of theory of relativity can be proved. But theory of relativity is not correct. Mass and time are absolute quantities. This also indicates that nature has upper limit for velocity and absolute frame of reference exists.

I
Introduction

An imaginary experiment in which matter is created in the body at constant rate. A force changing linearly with time is applied. The graph of force versus displacement, and area under the curve gives amount of work done. The values obtained by single integration and double integration should be consistent. By double integration kinetic energy of the body is zero. Since work is done . The body has got kinetic energy obtained by the single integration. So for double integration it necessitates to assume that the upper limit should be greater than rest mass of the body. This means that amount of work done is equivalent to mass . By the law of conservation of energy when the body moves increase in mass of the body is real. In other words total energy of the body measured by all observers is same irrespective of their state of motion.
According to theory of relativity mass is relative or total energy of the system measured by all observers is different and it depends on their velocity .So total energy is not constant. Although energy is conserved for all inertial frames of reference. But it is proved by the law of coservation of energy that increase in mass of the body is real and amount of work done is independent of the velocity of the body. So total energy of the system is constant and is same for all observers irrespective of their state of motion. Force can accelrate the body up to free space velocity of light.

We calculate velocity of the body by measuring distance travelled divided by time taken. This method is called conventional method. We can use light pulse to determine velocity of the body. Now consider the case , when a body and inertial frame are moving in opposite direction and their velocity is nearly equal to the velocity of light wrt stationary frame. Then the velocity of approach or receding measured by stationary observer is nearly equal to 2C If we use light pulse to determine relative velocity , we find that the relative velocity is less than C Therefore we get two values for relative velocity of the body . One is measured with the light pulse and another one is by conventional method. This indicates that there exists an inertial frame for which the relative velocity of the body measured by using light pulse and by conventional method is equal.The inertial frame having this property is called absolute frame. The different values for relative velocity of the body obtained by using light pulse and conventional method determines the absolute velocity of the inertial frame with which measurements being made. The absolute nature of mass determines the absolute frame. It is assumed that time is flowing uniformly at the same rate and is independent of the motion of the inertial frame. In otherwords universe has cosmic clock. The intervals of time measured by all observers is same . The addition law of velocity is derived by the laws of conservation of momentum and energy.

II
Theory and Proofs:

i)By the proof E=m.C^2 we get the following results

i) Nature has upper limit for velocity ie force can accelrate the body up to maximum velocity C
ii) When the body accelrates increase in mass of the body is real. So total energy of the body measured by all observers is same irrespective of their state of motion.

Proof:

Matter is created in the body at constant rate m_α of rest mass mo
We treat the mass of the body constant
At the instant of application of force the creation of matter starts
m=mo+m_α.t
A force changing linearly with time is applied.
Instantaneous momentum is p=m.v

Force acting on the body is
F=m.dv/dt+v.dm/dt
Or
F=mo.a+2m_α.t.a
Differentiating again dF/dt=2m_α.a
dF=2dm.a
Work done is W=$\int$ F.ds
Force and displacement are in the same direction
The graph of force versus displacement and area under the curve gives amount of work done. The values obtained by single integration and double integration should be consistent.
By single integration work done is
W=$\int$ (mo.a +2m_α.t.a).ds
Force accelrates the body from v=0 to v=v

Amount of work done is equal to gain in kinetic energy

KE=(mo. v^2)/2 + m_α .t. v^2 1)

In the second term of the integral m_α .t is the instantaneous mass produced and is independent of the increase in velocity of the body. So value of the integral is m_α .t. v^2

Now by double integration the area of the infinitesimal rectangle is dF.ds

So total area is equal to work done.

W= $\iint$ dF.ds

W= $\iint$ 2.dm.a.ds

W= $\iint$ 2.dm.v.dv

At time t=0 v=0 and m=mo

Velocity of the body increases from v=0 to v=v

And the limits of mass are from m=mo to m=mo+ m_α .t

Work done is equal to gain in kinetic energy

KE= $\int$ dm. $\int$ 2v.dv

Since matter is created at constant rate so increase in mass dm is independent of increase in velocity of the body.

$$KE=\int_{mo}^{mo+m_\alpha .t} dm \,.\, \int_0^v 2\, v.dv$$

KE= m_α .t. v^2 2)

Taking the limits as m_α tends to zero in eqns 1) and 2)

We get from eqn 1) KE =(mo. v^2)/2

And from eqn 2) KE=0

From eqn 2)the kinetic energy of the body is zero but from Newtonian mechanics by single integration KE=(mo. v^2)/2 Which contradicts the law of conservation of energy. Since work is done the body has got kinetic energy. This necessitates to assume that in the upper limit the mass of the body should be greater than rest mass of the body. Ie when the body is moving it has greater mass . This means that the supplied energy is equivalent to mass or gain in kinetic energy of the body is equivalent to increase in mass of the body.

In otherwords the amount of work done is proportional to increase in mass of the body . A body is accelrated with certain velocity wrt the observer at rest and for other observer moving with same velocity in the same direction as the body then relative to him the body is at rest so its kinetic energy is zero but for observer at rest the body has kinetic energy. If we say that the amount of work done depends on velocity of the body. Then wrt the observer at rest the body has kinetic energy so mass of the body is increased wrt him, but for other observer the body is at rest so according to him there is no increase in mass of the body. This means that the amount of work done or kinetic energy of the body depends on velocity of the observer. This violates the law of conservation of energy because energy is expended in accelrating the body.So where this energy goes or in what form is present. This necessitates to assume that increase in mass of the body is real and if this is true then the amount of work done should be independent of the velocity of the body. So increase in mass of the body measured by all observers is same irrespective of their state of motion. Ie it does not matter whether the observer is at rest or accelrating or moving with certain velocity. Hence energy is conserved.

Therfore amount of work done or gain in kinetic energy of the body is directly proportional to increase in mass of the body.

W=KE= Δ m.K 3)

Where K is a constant of proportionality.

Thus as the velocity of the body increases the mass of the body increases. Therefore it is a function of velocity

So taking the limits of mass from m=mo to m=m'

Where m'=mo.f(v)+ m_α .t

Force accelrates the body from v=0 to v=v if we take the limits of velocity from v=0 to v=v then amount of work done depends on velocity of the body.So energy is not conserved. But from the law of conservation of energy, the amount of work done or increase in mass of the body is independent of the velocity of the body. All observers measure increase in mass same irrespective of their state of motion. So we take the limits of velocity from v=0 to some constant value v=u

Now kinetic energy gained by the body is

$$KE=\int_{mo}^{m'} dm . \int_{0}^{u} 2v.dv$$

KE=(m'-mo). u^2 4)

Now taking the limit as m_α tends to zero in eqn 4)

Where m'=mo.f(v)+ m_α .t

Therefore

m'=mo.f(v)

since KE = Δ m.K

Δ m.K= Δ m. u^2

u^2 =K

The relation u^2 =K means that the force can accelrate the body up to u only. This means that this is the maximum velocity. It is known that the free space velocity of light is the maximum velocity. Therefore u=C

KE=(m'-mo). C^2

Or

E=m'. C^2

Hence total energy of the body measured by all observers is same irrespective of their state of motion

The notation m' is replaced by m

E=m. C^2

ii)We derive mass energy equation by assuming mass varies with velocity.

Proof: Let us consider the body of rest mass mo

A force is applied on the body . Instantaneous momentum is p=m.v

Force law may be anything. It can be measured by measuring the rate of change of momentum. F=dp/dt

Differentiating wrt time

$dF/dt=2(dm/dt).dv/dt + m.d^2v/dt^2 + v.d^2m/dt^2$

dF=dF1+dF2

where dF1=2.dm.dv/dt and dF2= $(m.d^2v/dt^2 + v.d^2m/dt^2)$. dt

This indicates that the force has two components F1 and F2

If constant force acts on the body then

dF=dF1+dF2=0

or dF=dF1=-dF2

Work done by a constant force is given by

$W=\int F.ds$

By double integration $W=\iint dF.ds$

Or $W=\iint dF1.ds$

Therefore $W=\iint 2.dm.v.dv$

Force accelerates the body from v=o to v=v The limits of mass are from m=mo to m=m

If we take the limits of velocity from v=0 to v=v then amount of work done depends on velocity of the body. The inertial frames which are moving with different velocity measure the different amounts of kinetic energy. This violates the law of conservation of energy.Since definite amount of energy is expended in accelerating the body. So this necessitates to assume that increase in mass of the body is real and if this is true then amount of work done should be independent of velocity of the body. So increase in mass of the body measured by all observers is same irrespective of their state of motion. Hence energy is conserved. Therefore we take the limits of velocity from v=0 to some constant vale v=u(say) this indicates that force can accelrate the body up to velocity v=u and this is the maximum velocity.

Therefore $W=\int_{mo}^{m} dm. \int_{0}^{u} 2v.dv$

W=(m-mo). u^2

Since freespace velocity of light is the maximum velocity so u=C

KE=W=(m-mo). C^2

Or E=m. C^2

2)Variation of mass with velocity relation:
Proof:
A body of rest mass mo is accelrated to velocity v
Momentum of the body is p=m.v
Force acting on the body is
F=m.dv/dt+v.dm/dt
Work done is
W=$\int$ F.ds
Since force and displacement are in the same direction
We know that work done is W=$\int$ dm.C^2

dm.C^2=m.v.dv+dm.v^2
Force accelrates the body from v=0 to v=v
At v=0 m=mo and at v=v m=m
Integrating
$m = mo/\sqrt{1-(v/c)^2}$

Since mass is absolute. There exists an inertial frame of reference for which the mass of the body is minimum and it corresponds to the value v=0 This inertial frame is called absolute frame . The mass of the body varies with velocity wrt absolute frame.

Equivalence of mass and energy relation is proved by the assumption that mass is an absolute quantity. Therefore the absolute nature of mass determines the absolute frame. We found that the elementary particles can be accelerated to very high velocity approximately equal to velocity of light by using particle accelerators. The experiments of Kaufmann and Neumann have confirmed that the mass of the particle varies with velocity according to the above equation.The mass velocity equation is applicable only wrt absolute frame. But experiments shows that this equation fits well wrt laboratory frame of reference.This indicates that the velocity of earth wrt absolute frame is very small as compared to the velocity of light. Therefore the earth based reference frame can be considered as absolute frame. But special relativity finds that the mass is relative . We have not tested the nature of mass ie whether mass is absolute or not. Therefore we have to make experiment to test the nature of mass which is mentioned in the next section. If mass is found to be absolute then the absolute frame exists. Then we can describe motion of all inertial frames wrt absolute frame.

3)The velocity of light is same for all inertial frames of reference, and concept of absolute frame.
Proof:

Consider two bodies A and B moving with velocity u and C respectively measured by the observer at rest. Consider two observers one is at rest and other one is in the body A
Since the body B is moving with velocity of light
The velocity of the body B measured by the observer in A be v
If $v<C$ by addition law of velocities or by any other rule wrt the observer in A
A force is applied on body B
Then according to the observer at rest the body B is moving with velocity of light.
Since the force can accelrate the body up to maximum velocity C So the body cannot accelrate wrt the observer at rest
Therefore $dC/dt=0$
But wrt theobserver in A the body B is moving with velocity less than that of light ie$v<C$
So according to the observer in A the force can accelrate the body. This means that velocity of the body exceeds velocity of light wrt the observer at rest. But this is not possible because force can accelrate the body up to maximum velocity C only.
Since the velocity of the body A is arbitrary. So this must be true for other velocities.
Therfore wrt the observer in A the velocity of the body B should be velocity of light.
Hence velocity of light is same for all inertial frames of reference.

Now we discuss the Galilean velocity transformation equations . We measure velocity of a body (or speed) by distance travelled divided by time taken.Consider two inertial frames S and S' The frame S is stationary and the frame S' is moving with velocity u Let the body is moving with velocity u1 wrt S frame in the positive X direction.The relative velocity of the body measured by S' frame is
$v'=u1-u$

Let us consider the another case the body and S' frame are moving in opposite direction. The relative velocity is given by $v'=u1+u$
The reason for introducing the concept of absolute frame can be illustrated by the example given below.
Let the body is moving with velocity $u1=0.8C$ and the inertial frame S' is moving with velocity $u=0.7C$ wrt stationary frame. Both are moving in opposite direction. The relative velocity measured by S' frame is 1.5C The distance travelled by the body wrt S' frame in one second is 1.5C The velocity of approach or receding measured by stationary observer is also 1.5C By observations this result is true. But this contradicts the conception of velocity of light. It is proved that velocity of light is the maximum velocity and is same for all observers and is independent of the motion of the source. Since the body has velocity $u1=0.8C$ wrt stationary frame, which has velocity less than light.If we send a pulse of light from stationary frame S in the direction of motion of the body then light pulse can reach the body after some time. This means that if we have sent the pulse of light from S' frame the light pulse can reach the body which is moving with relative velocity 1.5C Thus the relative velocity of the body measured by using light signal we get different value less than C This means that we get two values for velocity of the body. One is measured with the use of light signal and another one is without using light signal or by conventional method.Suppose the observer in S' frame wants to find the position of the body.According to him by observations the relative velocity is 1.5C He uses this value to determine the position of the body. This raises the question what is the

physical significance of the value of velocity of the body obtained by using light signal. This indicates that there exists an inertial frame of reference for which velocity of the body obtained by using light pulse is same as by using conventional method.. The inertial frame of reference having this property is called absolute frame. We have arbitrarily chosen the inertial frame S as stationary. If the inertial frame S satisfies the above property then it would be an absolute frame. The different values for relative velocity of the body obtained by using light signal and by conventional method determines the velocity of inertial frame of reference wrt absolute frame.Therefore the constancy of velocity of light determines the absolute frame.

Now the question arises without using light signal how can we identify the absolute frame. This can be resolved. Since mass energy relation is derived by the assumption that mass is an absolute quantity. As we supply energy to the body increase in mass of the body is real. Therefore there exists an inertial frame for which the mass of the body is minimum and it corresponds to the value $v=0$ Therefore the absolute nature of mass determines the absolute frame. We can detect the motion of inertial frame of reference wrt absolute frame by measuring the mass of fundamental particles which are at rest relative to the inertial frame. It is possible to detect the motion of inertial frame by applying force to the body in all directions. The increase in mass of the body is more if the applied force is in the direction of motion and in opposite direction the decrease in mass of the body is more.Where as in the case of the body which is at rest wrt absolute frame , the application of force to the body in all directions mass of the body increases. Therefore we can find absolute motion of inertial frame.

4)Measurement of relative velocity:

Let us consider there are n number of inertial frames S1, S2, S3……..Sn moving with velocity u1, u2, u3……un wrt absolute frame.

Where $u1<u2<u3……<un$

Let a body of rest mass mo exists in all inertial frames. Therefore the body has different energy depends on the velocity of the inertial frame.

Therefore $E1<E2<E3……..<En$

Suppose we apply a same force to all bodies in opposite direction to the motion. The inertial frame S1 moving with velocity u1 has lowest energy compared to other inertial frames. Therefore the frame S1 will become an absolute frame and then S2 and so on. Finally the frame Sn will become as absolute frame. Now according to the observer in Sn frame he finds that the absolute frame appears to be moving with velocity un. But this contradicts the conception of absolute frame. But absolute frame is at rest. Therefore the measurement of velocity of the inertial frame wrt absolute frame has physical significance but conversely it is not. This indicates that the measurement of velocity of the given inertial frame should be made wrt other inertial frames which have velocity less than or equal to the velocity of the inertial frame under consideration.

In this case the inertial frame Sn is moving with velocity un . since there are (n-1) inertial frames having velocity less than un . Therefore we can measure the relative velocity of inertial frame Sn

Now consider the case when inertial frame Sn has become as absolute frame.Then for inertial frames which have velocity greater than un we get contradictory result that the absolute frame Sn is in motion. The contradiction can be eliminated if we measure the velocity of inertial frames wrt absolute frame. In otherwords it is to say that we measure the velocity of given inertial frame wrt absolute frame which has velocity less than the velocity of the inertial frame under consideration. Thus we conclude that we should measure the relative velocity of the given inertial frame wrt other inertial frames which have velocity less than or equal to the velocity of the inertial frame under consideration.

5)Addition law of velocities:

i) When the body and inertial frame S' are moving in the same direction.

Let us consider the body of rest mass mo moving with velocity u1 wrt absolute frame S

It is proved that we should measure the relative velocity of the body by inertial frames which have velocity less than or equal to u1 Therefore let us consider the inertial frame S'moving with velocity u and its velocity is less than u1 The body of rest mass mo also exists in this frame.

Since the measurement of velocity wrt absolute frame by using light pulse and conventional method is same. For the momentum and energy to be conserved we use light pulse to determine velocity.

After applying force to the body , its velocity increases from u to u1 and its mass increases from m' to m

Change in momentum measured by the observer in absolute frame is

Δp=m.u1-m'.u …. .1)

Initially the body is at rest wrt S' frame . The observer in S' frame finds that the body is moving with relative velocity v which is measured by using light pulse.

Since mass is absolute. Therefore momentum of the body wrt observer in S' frame is m.v

Therefore the change in momentum is

Δp=m.v ………2)

Equating equations 1) and 2)

m.u1-m'.u=m.v (eqn is in vector form)

where $m = mo / \sqrt{1-(u1/C)^2}$

and $m' = mo / \sqrt{1-(u/C)^2}$

simplifying

$u1 = (\gamma . u / \beta) + v$

where $\gamma = \sqrt{1 - (u1/C)^2}$ and $\beta = \sqrt{1 - (u/C)^2}$

.

If u1=C then relative velocity v=C
If the body is moving with velocity of light wrt absolute frame then the velocity of the body measured by all observers is C

For u1=C and u=C then v=0/0
This means that if the body and inertial frame S' are moving with velocity of light then we get indeterminate form. Therefore it is not possible to determine relative velocity.

For u1<<C then u<<C because $u \leq u1$
We get $u1 \approx u+v$

Or $v \approx u1-u$
We know that addition law of velocity obtained by conventional method is
v'=u1-u ……….3)

Therefore $v \approx v'$
This indicates that when the velocity of the body and the observer is very much less than C then the relative velocity of the body measured by using light pulse is nearly equal to the value obtained by using conventional method.

Solving for u1 we get

$$u1 = v.\beta^2 \pm \sqrt{v^2.\beta^4 - v^2.\beta^2 + u^2} \quad \text{……4)}$$

Positive root has physical significance , so we consider positive root only.

eliminating u1 from equations 3) and 4) we get the equation of the form u=f(v,v')
By measuring relative velocity of the body by using light pulse and conventional method, we can find the velocity of the inertial frame S' wrt absolute frame.
In the interval $0.6C \leq u1 \leq 0.9C$ For all possible combination of values of u and v we find that the maximum increment of u1 is 5% more than that of as predicted by special relativity equation u1= (u+v)/(1+ u.v/C^2)

For values other than this interval the increment of u1 is less than 1%

ii)Now we derive the equation for length contraction of an object. The addition law of velocity for the body and inertial frame S' are moving in the same direction. Is

(eqn is in vector form) $u1 = (\gamma.u / \beta) + v$
…….1)

putting u1=dx/dt and u=dx'/dt and integrating we get

x=$(\gamma.x'/\beta)$ + v.t
At the same instant of time , the coordinate of the first end of the object is
$x_1 = (\gamma.x_1^{'} / \beta)$ + v.t
The coordinate of the other end is
$x_2 = (\gamma.x_2^{'} / \beta)$ + v.t
The length of the object wrt absolute frame is
$x_2 - x_1 = (\gamma / \beta)(x_2^{'} - x_1^{'})$
or
$(x_2 - x_1) / \gamma = (x_2^{'} - x_1^{'}) / \beta$ =const=a(say) …….2)
Let length of the object at rest is Lo
Let the object is at rest wrt absolute frame then u1=0 therefore u=0 because u≤u1
$(x_2 - x_1) = (x_2^{'} - x_1^{'})$ =a=Lo
Let length of the object in motion is
$(x_2 - x_1) = L$ and $(x_2^{'} - x_1^{'}) = L'$

Eqn 2) becomes
$L / \gamma = L' / \beta$ =Lo
Or
$L = Lo.\sqrt{1-(u1/C)^2}$ and $L' = Lo.\sqrt{1-(u/C)^2}$
This indicates that the length of the object which is moving with velocity u wrt absolute frame appears to be shorter by the factor B When its velocity increases to u1 its length appears to be shorter by the factor G The inertial frames which are in motion according to them the absolute frame appears to be in motion. Therefore the length contraction has symmetrical effect. Since the earth based reference frame can be considered as absolute frame. Therefore the experiments performed in the laboratory frame of reference have verified this equation.

iii)When the body and inertial frame S' are moving in opposite direction.
Let us consider the body of rest mass mo moving with velocity u1 wrt absolute frame S It is proved that we should make measurement of relative velocity of the body by inertial frames which have velocity less than or equal to u1
Let the inertial frame S' is moving with velocity u and its velocity is less than u1
Both are moving in opposite direction.
The relative velocity of the body measured by the observer in S' frame by using conventional method is v'=u1+u
Therefore the momentum of the body wrt S' frame is
p=m.v' ……..1)

where $m = mo / \sqrt{1-(u1/C)^2}$

or m= mo/ γ

Let the relative velocity of the body measured by using light pulse is v

Therefore the ratio p/v gives mass called as effective mass.

So, m'=p/v

Or

p=m'.v …….2)

Since the relative velocity of the body is independent of mass . Therefore the effective mass varies with velocity according to the equation

$m' = mo / \sqrt{1-(v/C)^2}$ or m'=mo/ β'

Equating eqns 1) and 2)

m.v'=m'.v

or

m.(u1+u)=m'.v

u1= $(\gamma.v/\beta')$ – u

solving for v we get

$v = (u1+u) / \sqrt{\gamma^2 + ((u1+u)/C)^2}$ ………3)

If u1=C then v=C therefore u=0/0

This indicates that if the body is moving with velocity of light then the relative velocity measured by all observers is C But it is not possible to determine the velocity of inertial frame , because we get indeterminate form.

For u1<<C then u<<C because u $\leq$ u1

Then eqn 3) becomes

v $\approx$ u1+u

The relative velocity of the body obtained by conventional method is

v'=u1+u ……4)

therefore v $\approx$ v'

This indicates that when the velocity of the body and the observer is very much less than C then the relative velocity of the body measured by using light pulse is nearly equal to the value obtained by using conventional method.

Solving for u1 we get

$u1 = (-u.\beta'^2) \pm \sqrt{u^2.\beta'^4 - u^2.\beta'^2 + v^2}$ ……5)

Positive root has physical significance , so we consider positive root only.

Eliminating u1 from equations 4) and 5) we get the equation of the form u =f(v,v')

By measuring relative velocity of the body by using light pulse and conventional method, we can find the velocity of the inertial frame S' wrt absolute frame.

In the interval $0.6C \le u1 \le 0.9C$ For all possible combination of values of u and v we find that the maximum increment of u1 is 5% more than that of as predicted by special relativity equation u1= (v-u)/(1- u.v/C^2)

For values other than this interval the increment of u1 is less than 1%

6)Time dilation ie an event takes more time in motion than at rest or intervals of time measured by all observers is same irrespective of their state of motion.

Proof:

It is assumed that time is flowing uniformly. Universe has cosmic clock.

Consider two observers one is at rest say on earth and other one is in the space craft moving with velocity v

Since energy is created at constant rate. Energy comes into existence in zero time. Ie for eg particles like neutron, photon,come into existence when the interval of time becomes equal to their creation time

Consider an event the creation of matter of rest mass mo.

The body is created on earth wrt the observer at rest the body is created at time to=mo/m_α

Consider another event the body which is created in the space craft has mass $m = mo/\sqrt{1-(v/c)^2}$

Since total energy of the body measured by all observers is same irrespective of their state motion.ie observer at rest and in the spacecraft measure the mass of the body same.

So the creation time is t=m/m_α

Therfore $t = to/\sqrt{1-(v/C)^2}$

This means that wrt the observer in the space craft the creation time is more and is also same for observer at rest. Because the mass of the body is same for all observers irrespective of their state of motion.

Assuming this eqn holds generally

This indicates that an event takes more time in motion than at rest.

The elementary particles which are created in the particle accelrators decay into other elementary particles. The experiments on the unstable elementary particles have shown that the lifetime varies with velocity according to the above equation . We have derived this equation by assuming mass as absolute quantity. Therefore the intervals of time measured by all observers is same. This equation indicates that an event takes more time in motion than at rest.

III Experiment to test special relativity:

According to theory of special relativity mass is relative. It depends on the velocity of the body. But we have proved equivalence of mass and energy relation by the assumption that mass is an absolute quantity. The absolute nature of mass determines the absolute frame. We have derived addition law of velocity , length contraction equation and time dilation equation by assuming that mass as absolute quantity. Therefore we should make experiment to test the nature of mass. We have highly photosensitive device to measure frequency of radiation . So we can test the relativity of mass by annihilation of matter. To get the significant value in the measurement of kinetic energy we use particles of large rest mass , and to get high velocity we have to use spacecraft. Since antiproton is a stable particle. We use proton and antiproton for annihilation. It is assumed that laboratory frame as absolute frame. But this assumption is not essential. Because we are interested in calculating the total energy but not kinetic energy. Therefore we can calculate total energy by measuring frequency of the emitted photons in the annihilation of matter. The annihilation of proton and antiproton has to be performed in the laboratory frame of reference. The velocity of both proton and antiproton is made to zero or very small wrt laboratory frame. Therefore, after annihilation two photons of equal momentum and energy is created . The photons move in opposite direction. The total energy of the photons is $E = 2mo.C^2$

Now we perform this experiment in the space craft frame of reference moving with certain velocity (say 10 km/s) The annihilation of proton and antiproton is carried out in the spacecraft frame of reference. The velocity of proton and antiproton is made to zero relative to the spacecraft frame. It is proved that mass is an absolute quantity. Since spacecraft is moving with certain velocity wrt laboratory frame. Therefore it has kinetic energy. The protons and antiprotons are in the spacecraft. So they have kinetic energy. Therefore the mass of proton and antiproton increases by an amount equivalent to their kinetic energy. The total energy of proton and antiproton is $E=2.mo.C^2 + 2.KE$

After annihilation of proton and antiproton we get two photons of equal momentum and energy. But total energy of the photons is more as compared to the experiment performed in the laboratory frame of reference and is given by $\Delta E=2.KE$

The total energy of the photons is $E=2.mo.C^2 + 2.KE$

If special relativity is correct then the total energy of the photons emitted wrt laboratory frame of reference and spacecraft frame of reference is equal , which is $E=2.mo.C^2$

Otherwise we get mass as absolute quantity.

IV Results and Discussion:

We measure kinetic energy of the body if and only if there is a relative motion between the body and the observer . The inertial frames which are moving with different velocities measure different amounts of kinetic energy. Suppose a force is applied on the body for certain interval of time. Then the amount of work done or change in kinetic energy measured by all observers is different. This means that the amount of work done depends on velocity of the body.This violates the law of conservation of energy because definite amount of energy is expended in accelerating the body. This indicates that the amount of work done should be independent of velocity of the body . But the expended energy should appear in other form.This necessitates to assume that when the body is in motion it has greater mass. Therefore the amount of work done is proportional to increase in mass of the body. Energy is conserved if and only if we assume increase in mass of the body is real so that increase in mass of the body measured by all observers is same irrespective of their state of motion.Hence energy is conserved. The mass of the body varies with velocity according to the equation $m = mo / \sqrt{1-(v/c)^2}$

Therefore the absolute nature of mass determines the absolute frame. But according to special relativity mass is relative , it depends on velocity of the body. The experiments performed in the laboratory frame have verified the mass velocity equation. But this equation is applicable only for absolute frame. This indicates that the velocity of the earth wrt absolute frame is very small as compared to the velocity of light. Therefore the earth based reference frame can be considered as absolute frame.

The addition law of velocities is derived by the laws of conservation of momentum and energy. For the energy to be conserved we have to use light pulse to determine the velocity.The addition law of velocities obtained by using conventional method is applicable only for material particles but not applicable for particles moving with velocity of light.Since mass is absolute and velocity of light is same for all observers .This indicates that there exists an absolute frame with which we can describe motion of the body . The different values for velocity of the body obtained by using light pulse and by conventional method determines the velocity of the inertial frame wrt absolute frame. Thus the constancy of velocity of light determines the absolute frame. By the addition law of velocity we find that , when an object is in motion the length of the object appears to be shorter wrt absolute frame and is given by the equation $L = Lo.\sqrt{1-(v/C)^2}$ Since the earth based reference frame can be considered as absolute frame. So the experiments have confirmed the verification of length contraction equation wrt laboratory frame. It is assumed that time is absolute . Universe has cosmic clock. The time flows uniformly at the same rate and is independent of motion of the inertial frame. An event takes more time in motion than at rest according to the equation $t = to / \sqrt{1-(v/C)^2}$ The experiments on the unstable elementary particles have verified the time dilation equation wrt laboratory frame. The results time dilation, length contraction and addition law of velocity is derived by the assumption that mass is an absolute quantity. Therefore we should make experiment to test the nature of mass.

V

Conclusion:

When the body is accelrated increase in mass of the body is real and is same for all observers irrespective of their state of motion. In otherwords total energy of the body measured by all observers is same. The intervals of time measured by all observers is same . An event takes more time in motion than at rest. Therefore mass and time are absolute quantities.

Theory of relativity is formulated based on the constancy of velocity of light. Energy is conserved for all inertial frames of reference. But total energy of the system is not constant because it depends on the velocity of the observer. This violates the law of conservation of energy because total energy of the system measured by all observers is same irrespective of their state of motion. It is proved that mass and time are absolute quantities. We have to formulate the laws to hold in all inertial frames of reference based on the law of conservation of energy. The relativistic velocity transformation equation and spacetime transformation equation doesnot obey laws of vectors. But in this new theory , addition law of velocity is derived by the laws of conservation of momentum and energy. For the energy to be conserved we have to use light pulse to determine velocity. The different values for relative velocity of the body obtained by using light pulse and by conventional method determines the velocity of the inertial frame wrt absolute frame. So, we can describe motion of the body wrt absolute frame.

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