

Length Contraction and Time Dilation with Real Dimensions of Space-Time

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Abstract: Space-time is a single entity was discovered by former scientist Sir Albert Einstein. In his experimentation with speed of light, he observed two variations, one with distance and other one with time such that variation in one factor resulted in variation of the other called length contraction and time dilation respectively. These two being the true findings of Sir Einstein, have misinterpretations in reality which is explained and solved in this journal.

- According to his interpretation, speed of light results in shortened distance called contraction in length and a time delay called dilation in time.
- These two variations are pertaining to the aspects of space and time but it is interpreted physically in objected oriented perspective, in terms of distance and clock time.
- His first observation obviously with the variation in time whose value of dilation, made him presume consequential changes in distance itself.

Now let us see how these variations are wrongly assumed or misinterpreted in real-time.

Keywords: Length contraction, time dilation, real dimensions, sp-ti 0.

1. INTRODUCTION

1.1. Experimentation results with speed of light in existing studies, expressed as follows,

- 1) Travelling at the speed of light is approaching time zero. If any object could travel at this speed, would reach time 0.
- 2) Travelling towards time zero would enable us to reach the destination almost instantaneously.
- 3) Travelling at the speed of light also result in contraction in length(distance) which enables destination to be closer to the travelling object in space.
- 4) If the speed of light approaches time zero, then travelling faster than light might take an object to its time negative called past time.
- 5) Based on the above points twin theory is proposed saying that, one of the twins allowed to live on earth and the other one to travel in space at the speed of light. After few years, the person travelled at light speed, on his return to earth, would be still young but see his twin sibling to have become older. Means, person travelled at a speed in space would have come to his future, as many years must have passed away in earth while he had consumed only less time in sky.

1.2. Basic queries and justifications,

- 1) For speed of light approaching time zero, it is evidently known in modern science that, to travel from one galaxy to the other, even for the light particles, it would take time (say) 1000 light years.
- 2) Length contraction is not happening in space and the light is travelling the actual distance. One cannot come up to say that, after all the length contraction, light is travelling in light years, because it is declared that light would reach time zero means distance is meaningless as the travel is going to be instantaneous.

- 3) There is a logical question, If the speed of light has a constant value which is finite, why the two said variations are assumed to be continuous to approach time zero or length contracting to zero?
- 4) What would be the achievement in science by travelling faster than light? Even if an object travels faster than light speed, the travelling time in light years would reduce to a low value, say for example from 1000 light years to 500 light years.
- 5) If there are formulas to calculate time dilation and length contraction, what does the change in these values different from estimated values, implies in space-time?

2. REAL DIMENSIONS

- We shall see the drawings of real dimensions of space-time in terms of aspects to visualize length contraction and time dilation in reality.
- Drawings are no less than derivations and expressions, as arts and science is also an inseparable duality same like space and time.
- In fact, there is a point beyond which only the point of the sketch pen works where physics and mathematics fails as the geometry of space-time starts collapsing to nothing(zero).

2.1. Need for real dimensions

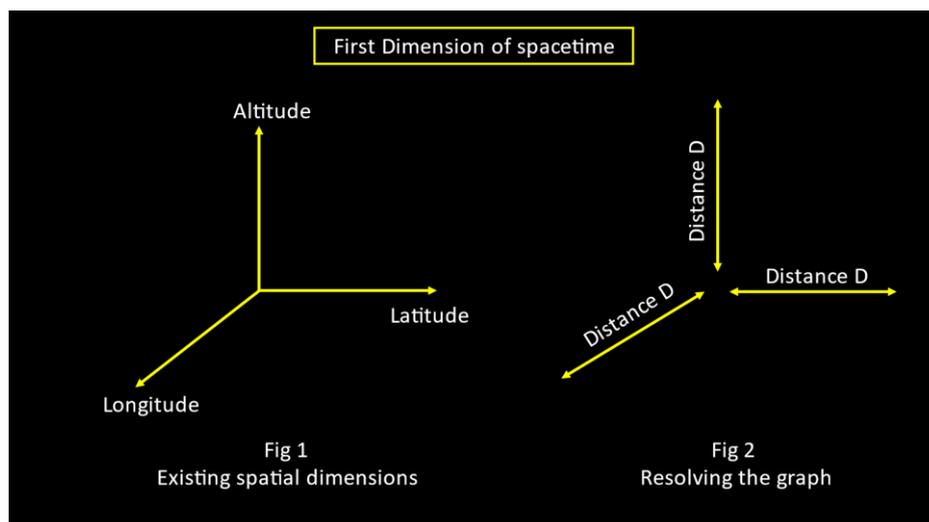
- The three spatial dimensions (Latitude, longitude and altitude) in the existing studies are imaginary which does not describe anything about the nature of space except to say sky is a curvature.
- All the three said dimensions are only known on the object side, means these lines could not be distinguished or even find to exist without a reference object such as earth.
- And real dimensions of space-time shall contain the knowledge of the entire existence like a seed that contains its tree.

2.2. Justification for real dimensions

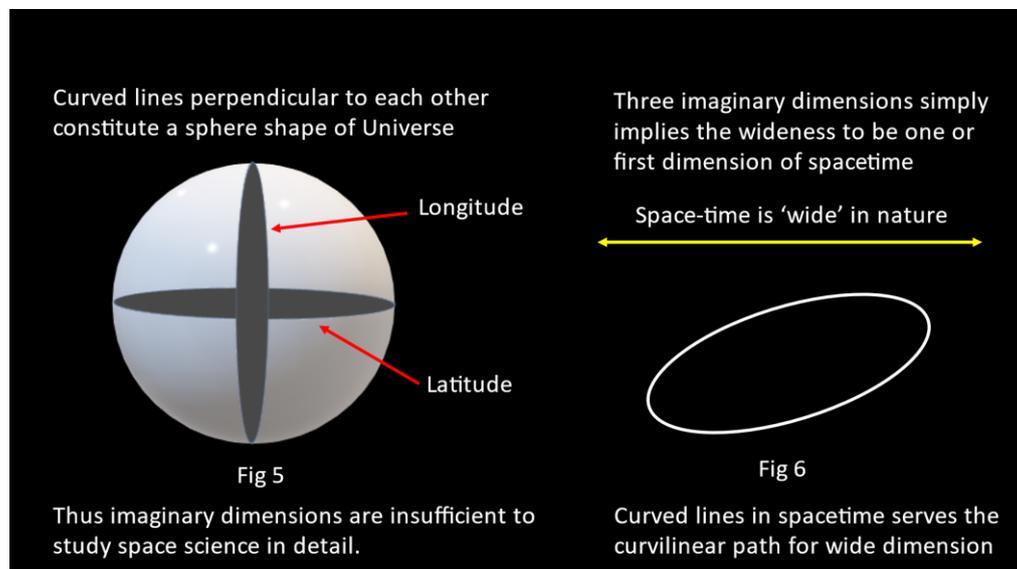
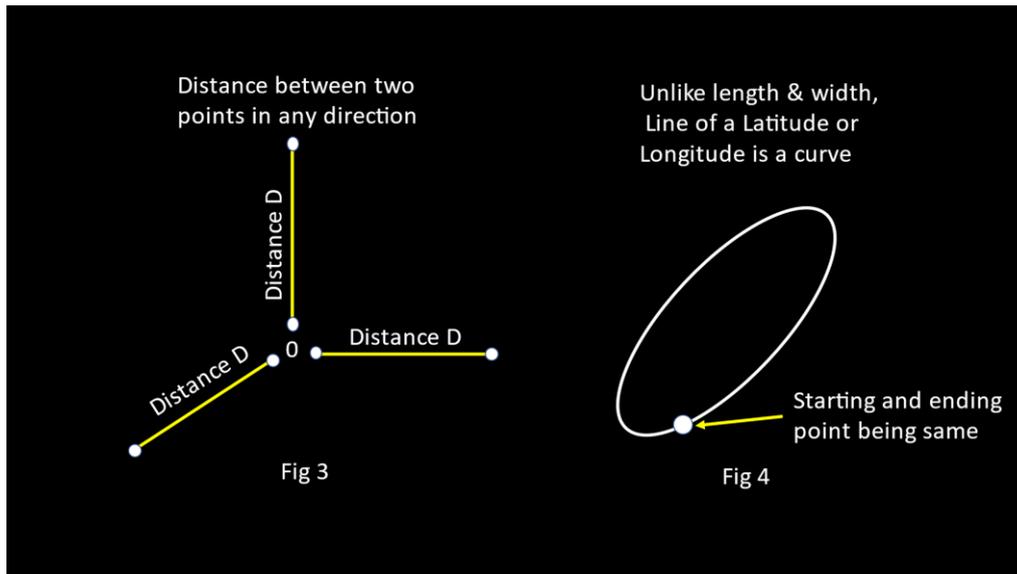
- Even after the discovery of space-time to be a single entity that, space and time are not two different kinds but shall be called as a single term 'spacetime', why the existing studies in physics is still followed with three spatial dimensions separately and time to be the fourth dimension in one direction separately?
- Then how the dimensions should be? Without separation of space and time, it shall be like - First dimension of space-time, second dimension of space-time, third and so on.
- The space-time itself need not be a dimension, if needed it shall be considered as zero dimension (Base)

3. DIAGRAMMATIC ILLUSTRATIONS TO ARRIVE LENGTH CONTRACTION AND TIME DILATION IN REALITY THROUGH REAL DIMENSIONS

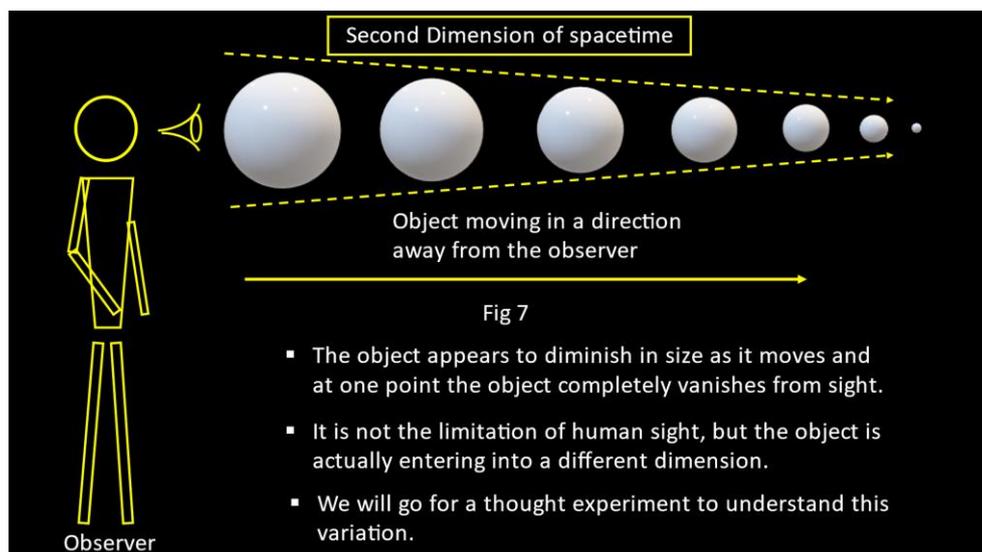
3.1. First dimension of space-time

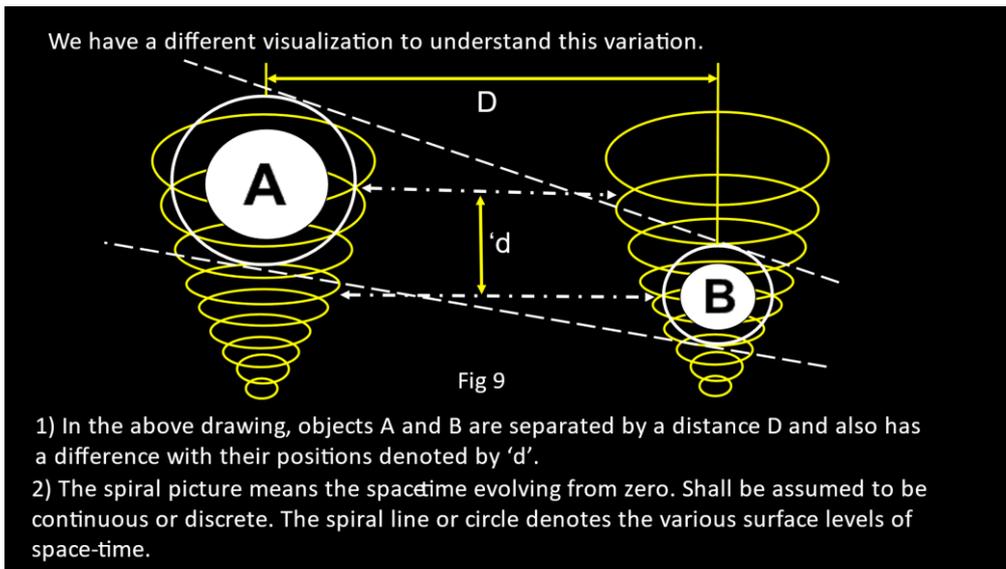
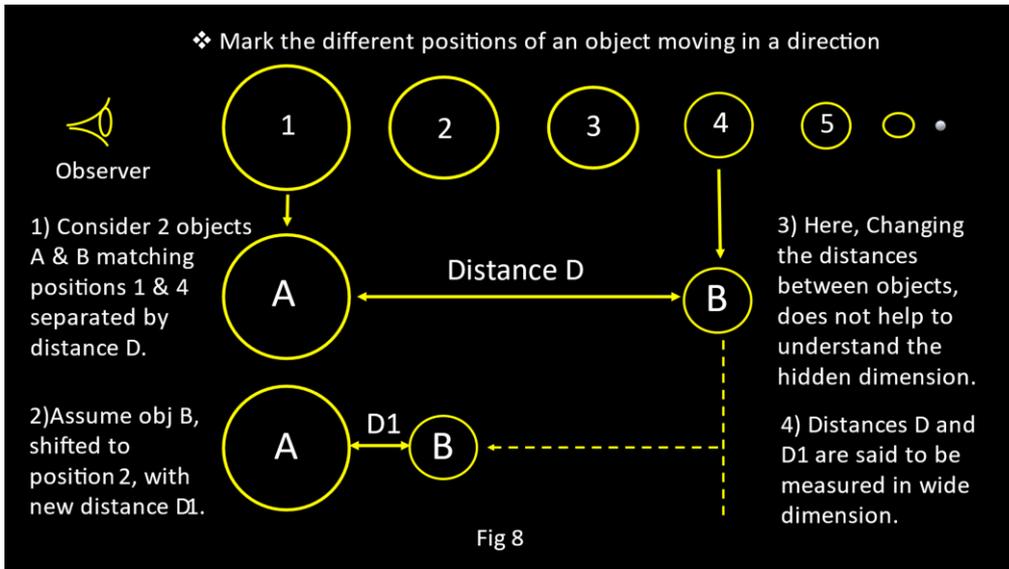


- In absolute perspective, space-time has no directions, but for an object, it serves the multi-directional living space. So, resolving the graph for distance between two points in any direction in space-time as shown in Fig 2.

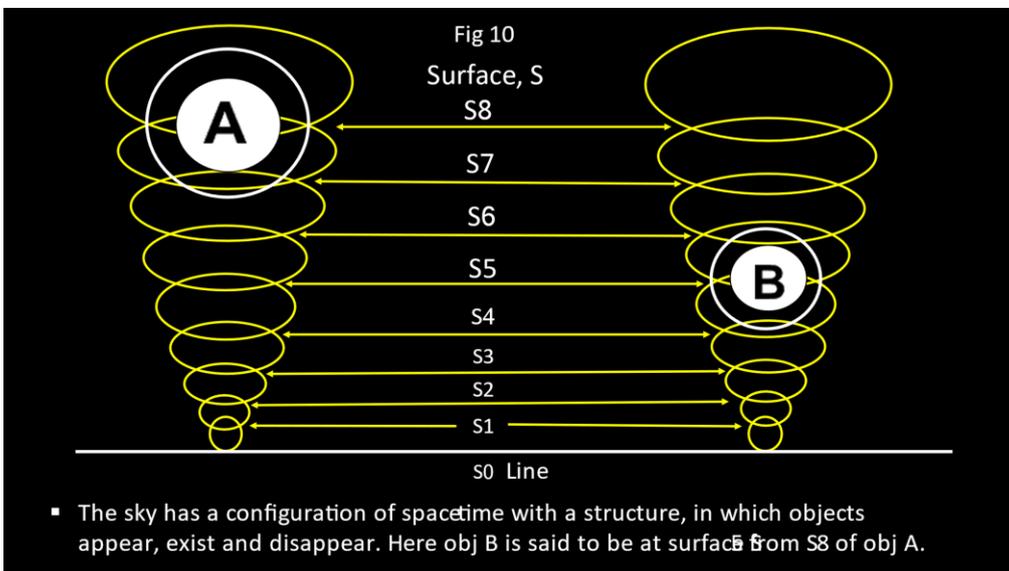


3.2. Second dimension of space-time

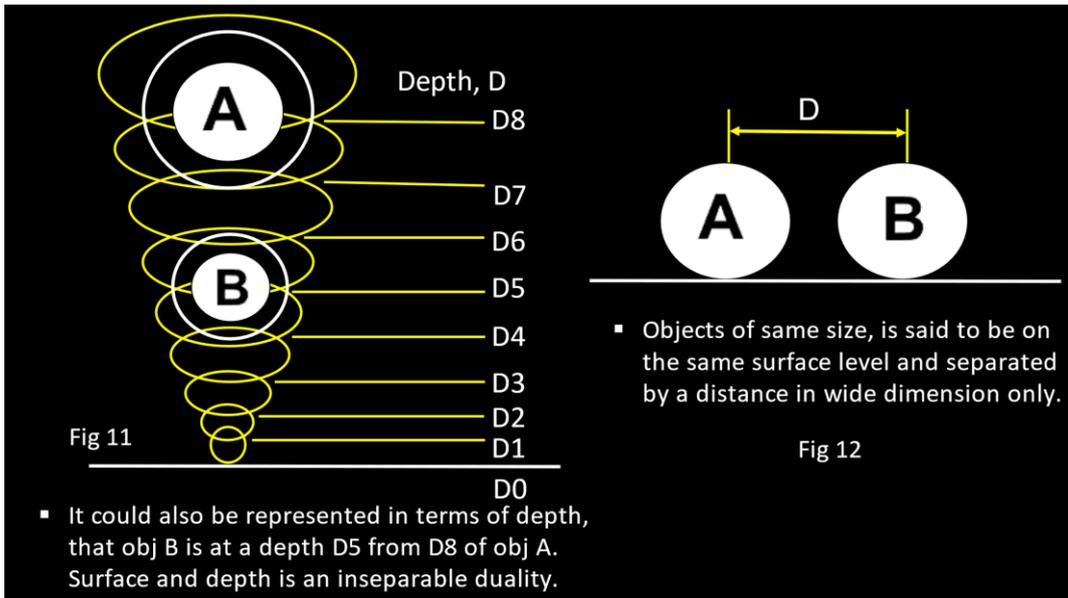




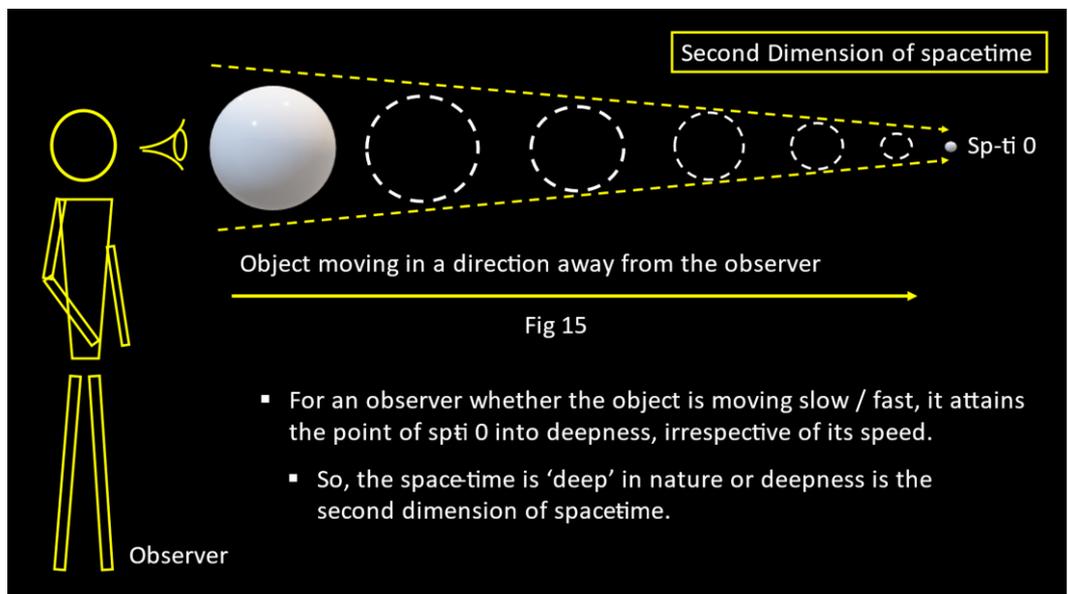
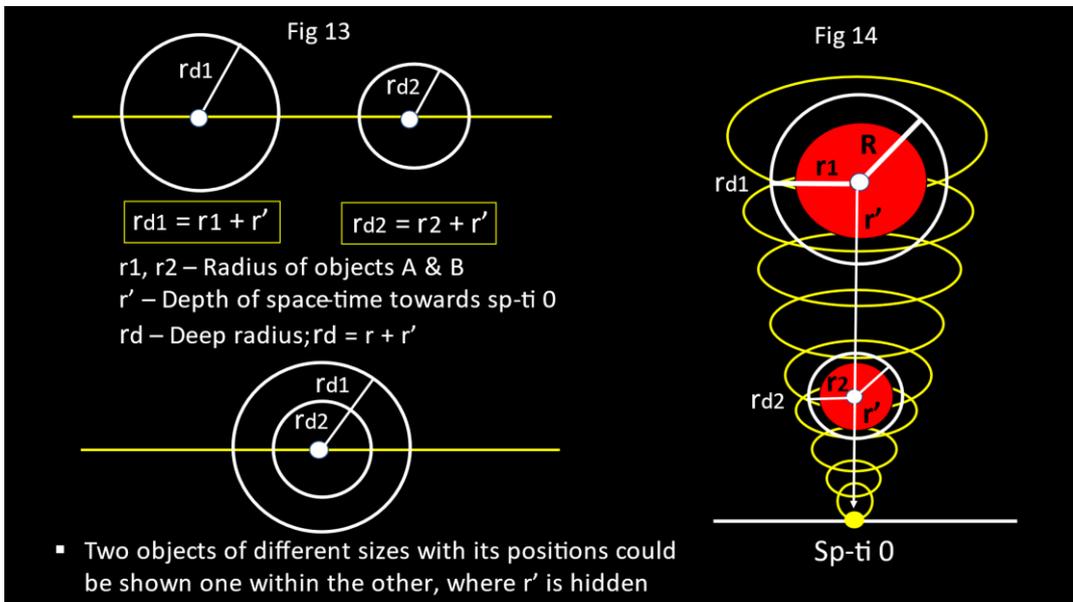
(Single line drawings shall be considered to have drawn in space-time itself)



The sky has a configuration of space-time with a structure as a background, in which objects appear, exist and disappear. Here object B is said to be at surface S5 from S8 of object A.



(Single line drawings shall be considered to have drawn in space-time itself)



3.3. Practical understanding (real-time illustration)

We shall understand the deep dimension of spacetime with a simple example in our day to day life. Consider a water well built with symmetry as shown below.

Fig 16

- Top and bottom circles of the well have the same diameter. Now looking into the well, the bottom circle appears to be smaller and contained with the top one.
- It indicates the depth of the well. However if we try to go near the bottom, this deceptive appearance will be solved. Means this is not a depth in reality.
- We actually measure the height of the well in wide dimension. Deepness of spacetime cannot be measured like this indeed.

- Then, is the deepness also false in nature? No. What could really make an object deep in space-time? It is nothing but the size of the object.
- Though the bottom circle is deceiving in appearance, the small size of the circle indicates the depth of the well. So, small objects are deep in spacetime and dimensionally it is said to be contained within bigger objects.
- Also it is physically impossible to go deep into spacetime due to size factor. Observing a particle in second dimension does not mean accessing the dimension itself.

Fig 17(a)

(Single line drawings shall be considered to have drawn in space-time itself)

- Now, let us consider spacetime to be a circle. Speed of light is expected to travel a length(Distance) with respect to its time. So, this value together constitute a estimated space-time circle A.

Fig 17(b)

- Light particle with its speed, resulted in length contraction and time dilation. Here length contraction directly implies space to have reduced. Time dilation is, ticking of one moment to next moment is slowed down towards zero. Means time is also reduced. So, this value together could be shown with a reduced spacetime circle B.

- Here, the two circles are shown with a distance between them, this is to denote, the light particle, only after having travelled a distance with its speed, is known for length contraction and time dilation.

Fig 17(c)

- And tangents T1 & T2, ends up in sp-ti 0, which indicates the misconception of speed of light approaching time zero. If spacetime is a single entity, then the object has to reduce itself to reach space zero also. Space zero means, no space(Object doesn't exist at this point).

(Single line drawings shall be considered to have drawn in space-time itself)

- Travelling at the speed of light from one galaxy to the other galaxy, taking a time in light years, evidently shows even the light is obeying the conventional formula of speed which is distance travelled by time taken. So, the following drawing solves this problem clearly.

Fig 17(d)

Note: Tangents are also solved, indicating experimental results (Length contraction and time dilation) to be finite.

- Here, the light particle in deep dimension, without having to travel a distance, it is near sp-ti 0 axis and secondarily if it moves in a direction, it is parallel to this axis. Thus speed of light never approaching zero but close to sp-ti 0. Circles A & B' is same as water well.

3.4. Arriving length contraction and time dilation

- ❖ Application of wide and deep dimensions of spacetime: Solves the misconception about light(Photon).
- What is the observation about speed of light resulting in length contraction and time dilation actually indicates? How these changes still works with conventional speed formula
- Consider space-time to be a line that contains the value of speed of light which is equal to distance travelled by time taken. Let space and time be two halves of this line.

✓ Motion of the object is equal in space and time

Space

Time

Fig 18

Speed of light in space-time

Length contraction

Time dilation

- This is a deceptive appearance and surface level observation of which gives false results, the true nature is hidden behind it, which has to be seen through this.

- This time, we need not divide the line AA' for distance(length) and time, instead we take another line BB' for actual length travelled with respect to time by the light, distinguished from estimated or calculated line.

Top view of well
Depth is an indication
A
B
Sp-ti 0
Fig 19

Estimated Line
A A'
S1 S2
Reduced Line
B B'
Sp-ti 0
Deepness in actuality
Fig 20

- Circles A & B of Fig 19 are said to be symmetrical, whereas the lines AA' & BB' of Fig 20 are proportional in spacetime scale represented by tangents S1 and S2 emerging from sp-ti 0 or ending in sp-ti 0.

- This time, we need not divide the line AA' for distance(length) and time, instead we take another line BB' for actual length travelled with respect to time by the light distinguished from estimated or calculated line.

$$\text{Speed} = \frac{\text{Distance travelled}}{\text{Time taken}}$$

$$\text{Speed of light} = \frac{\text{Length contraction}}{\text{Time dilation}}$$

The above formula further solved to,

$$\text{Speed of light} = \frac{\text{Proportional Length}}{\text{Proportional Time}} \quad (\text{with respect to sp-ti scale})$$

- ✓ However, proportionality in length and time could not be measured, as the dimensions involved are aspects of space-time.
- ✓ Which means we shall know all these dimensions for our knowledge of existence to solve the mysteries, fictions, hypotheses and thereby formulate the fundamental study of space science.

Dilated time
Actual length
Actual time
Fig 21
Deepness is radial along sp-ti scale S1 & S2
Sp-ti 0

In the below table, the object-oriented dimensions in terms of measurements – Length, width, height and radius are under one dimension of wideness in space-time. Here deep radius is associated with space-time and different from radius of an object, to be noted.

Table of new discovered dimensions in space science			
S. No.	Real Dimensions of space-time (In terms of Aspects)	Path / Nature	Object oriented dimensions in space-time (In terms of Measurements)
1	Wide	Curvilinear	Length L (Wide)
			Width W (Wide)
			Height H (Wide)
			Radius R (Wide)
2	Deep	Radial	Deep Radius rd (Deep)

4. DISCUSSION AND CONCLUSION

Points to remember

- 1) Real dimensions are mandatory to understand space-time in reality. The dimensions (wide and deep) discussed in the above study are newly discovered or introduced ones.
- 2) Length contraction and time dilation are just variations observed at the surface of space-time which actually indicates the dimensions at the background with a configuration for space-time.
- 3) The terms such as sp-ti 0, deep radius(rd) is also newly introduced for studies.
- 4) Please note that space zero is unknown in the existing study and explained here dimensionally for a point of no space to exist.
- 5) In the same way it could be shown that length contraction and time dilation are just experimental factors in space-time and does not cause any physical changes to the object with more detailed drawings.
- 6) In this journal, it is clear that the light particle even without having to travel a distance with its speed, it is already near to sp-ti 0 dimensionally and said to be travelling parallel to zero even from the starting point and never approaching zero.
- 7) Important note is, light is said to be bending space-time, but the truth is, it is already in a path closer to sp-ti 0. And the reason for bending is an appearance which is traced from our estimation point.
- 8) However, the light photons belong to particle physics which has lot of unsolved mysteries such as dual nature of a particle to behave like particle as well as wave, super positions, wave collapsing to particle when observed etc., could be solved with third dimension of space-time (to be published as continuation study).
- 9) Thus, concluding that, if one could not assume or explain length contraction clearly, it is obvious for him to misunderstand time dilation as well, as both are twin factors, based on which space-time was discovered to be a single entity
- 10) Note: length contraction and time dilation are solved here for finite observation whose interpretations are new for study. It was misinterpreted as an indefinite observation in the experimentation of speed of light, presuming to be continuous to approach zero in space-time.

REFERENCES

- [1] Physics text books of high school and college syllabus, referred for the scientific terms of length contraction and time dilation. It is visualized in reality which is different from assumptions in proposed theories and formulas of existing studies.
- [2] Mainly referred from theory of relativity (General and special) by respected scientist Sir Albert Einstein (Books, audio videos in internet) and his biography being the inspiration for my work.
- [3] Referred sample scientific journals in arcjournals.org for work template.

AUTHOR'S BIOGRAPHY



Prabhakaran Natesan, Tamil Nadu, India Bachelor's degree in Electrical and Electronics Engineering (2011) – Affiliated to Anna University, Chennai.

Working in a concern in UAE at present, interested in space science, seeking for opportunities to work in the same field, after 10 years of experience in building maintenance.

With self-reference, I have my original research work of "Solution for incompatibility between general theory of relativity and quantum mechanics through real dimensions of space-time" (Fundamental drawings).

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