

A Unique Similarity is There among Space, Mass, Energy, and Time. All Move in One Direction on Average with an Aim to Attain a State of Absolute Balance or State of Perfect Equilibrium. Why Time Slows Down Under the Influence of Mass?

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Abstract: Space, mass, energy and the physical time are just different states of the same thing. There is a unique similarity among space, mass, energy and the physical time. All can be smoothly transformed into one another given minimal information of only one state to decode the state and the decoded state can be related with proper equations to evaluate equivalent the other three states of the Universe. The unique similarity of all four states, space, mass, energy and the physical time is that all four states move in one direction (say positive direction) of average with an aim to minimize the imbalance of the other states to attain a state of absolute balance or a state of perfect equilibrium. Thus, the space-mass-energy-time chemistry has a non-linear chaotic motion in the Universe. The non-linear chaotic motion of mass can be observable by psychology as it is the gifted ability to see masses in light, but unable to see the motions of space, energy and the physical time. This is where ambiguity lives in human psychology to decode the Universe. Because we are unable to see all the other three states, we need machine to be invented to observe them. There are also transformation constants to transform from one state to the other states and vice versa. In this paper we will discuss about the transformations among states and will evaluate some properties of the physical time.

Keywords: The states of the Universe, Smooth transformations among states, A state of absolute balance or a state of perfect equilibrium, A non-linear chaotic motion, Ambiguity of human psychology.

1. Introduction and Theory

The four fundamental states of the Universe are space, mass, energy and the physical time. One can be smoothly transformed into any one or more than one of these other three states. Given minimal information of one state, other three states can be completely found out with proper mathematical relationship. So, there are at least four fundamental transformation constants for each of all four states if not more. Suppose, space is S , mass is m , energy is E , the physical time is T , the speed of light is C . Then, according to the mass-energy equivalence of Einstein's famous equation –

$$E = mC^2 \quad (1)$$

Similarly, the relationships of space with other three states are as follows,

$$S = K_{12}m \quad (2)$$

$$S = K_{13}E \quad (3)$$

$$S = K_{14}T \quad (4)$$

When the state mass m can be related with the other three states as follows,

$$m = K_{21}S \quad (5)$$

$$m = K_{23}E \quad (6)$$

$$m = K_{24}T \quad (7)$$

When the state energy E can be related with the other three states as follows,

$$E = K_{31}S \quad (8)$$

$$E = K_{32}m \quad (9)$$

$$E = K_{34}T \quad (10)$$

When the state the physical time T can be related with the three other states as follows,

$$T = K_{41}S \quad (11)$$

$$T = K_{42}m \quad (12)$$

$$T = K_{43}E \quad (13)$$

Thus, combining equations, 2, 3, 4, we can write,

$$4S = K_{11}S + K_{12}m + K_{13}E + K_{14}T \quad (14)$$

Combining equations, 5, 6, 7, we can write,

$$4m = K_{21}S + K_{22}m + K_{23}E + K_{24}T \quad (15)$$

Combining equations, 8, 9, 10, we can write,

$$4E = K_{31}S + K_{32}m + K_{33}E + K_{34}T \quad (16)$$

Combining equations, 11, 12, 13, we can write,

$$4T = K_{41}S + K_{42}m + K_{43}E + K_{44}T \quad (17)$$

With $K_{11} = K_{22} = K_{33} = K_{44} = 1$ and $K_{32} = C^2$,

$K_{23} = \frac{1}{C^2}$, we get all four states in matrix form with a

state matrix S_M 4×4 dimension.

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$$\begin{bmatrix} K_{11} & K_{12} & K_{13} & K_{14} \\ K_{21} & K_{22} & K_{23} & K_{24} \\ K_{31} & K_{32} & K_{33} & K_{34} \\ K_{41} & K_{42} & K_{43} & K_{44} \end{bmatrix} \begin{bmatrix} S \\ m \\ E \\ T \end{bmatrix} = 4 \begin{bmatrix} S \\ m \\ E \\ T \end{bmatrix}$$

Or,

$$\begin{bmatrix} 1 & K_{12} & K_{13} & K_{14} \\ K_{21} & 1 & \frac{1}{C^2} & K_{24} \\ K_{31} & C^2 & 1 & K_{34} \\ K_{41} & K_{42} & K_{43} & 1 \end{bmatrix} \begin{bmatrix} S \\ m \\ E \\ T \end{bmatrix} = 4 \begin{bmatrix} S \\ m \\ E \\ T \end{bmatrix}$$

Other transformation constants evaluation is subjected to experimental and theoretical analysis of the Universe to term them in terms of known constants of physics.

2. On average, all four states of the Universe are unidirectional

The mass and energy equivalence by Einstein's famous equation [1, 2], has a positive non-linear state constant C^2 and similarly, the states constant related to the physical time can also be treated as positive non-linear as time itself is unidirectional; which implies that all the constants related to space must be all positive non-linear because all the other three state's transformation constants are positive and non-linear. Because C is real valued, C^2 and $\frac{1}{C^2}$ can never be

negative, which means that a positive mass will provide positive energy and an anti-mass (negative mass) will provide negative energy (anti-energy) and vice-versa [3, 4].

$$E = mC^2 \tag{18}$$

$$-E = (-m)C^2 \tag{19}$$

Where, E and m are the positive energy and mass respectively. $-E$, $-m$ are anti-energy and anti-mass respectively. It implies that the transformation constants

C^2 and $\frac{1}{C^2}$ are always positive and non-linear which are

independent of whether mass or anti-mass and energy or anti-energy. Thus, mass and energy are unidirectional (say positive) for our Universe, so is the physical time (say positive) for our Universe which leaves space to be positive too as all other three states are being positive, that is the reason, the Universe is expanding to maintain the positivity of space [5, 6]; it also implies that space and the physical time have state constants positive and non-linear too; so is true for space-mass, time-energy too. That is why, all four dimensions are unidirectional. To create a time reversal, all the other three states have to be negative [7, 8]. The mass m has to be replaced by anti-mass $-m$, energy E has to be replaced by anti-energy $-E$ and space S to be replaced by anti-space $-S$, so that time T can be replaced by $-T$; if this happens, we will be replaced by our anti-selves [9, 10],

the whole Universe will be replaced by its anti-universe [11, 12].

3. Why the Physical Time Slows Down With the Influence of Mass

There are three possibilities for the physical time to slow down under the influence of mass. First, the time instants (discrete points of time) of reference might have frequency scaling (increased time interval between the discrete points of time i.e. time instants). For example,

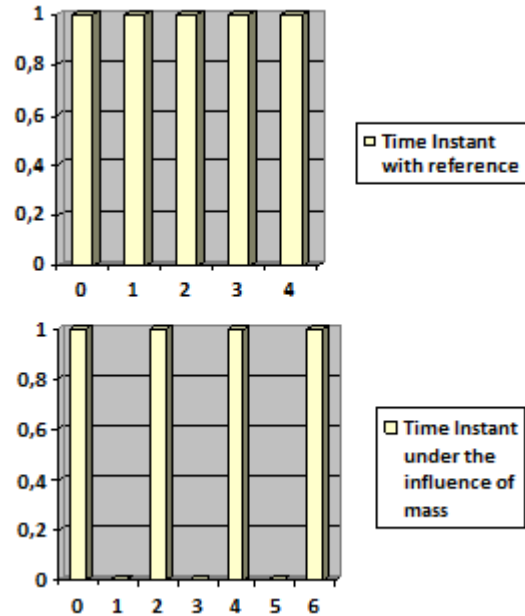


Figure: Frequency scaling of time under the influence of mass.

The slowdown of the physical time under the influence of mass might be due to amplitude scaling of discrete time instants of reference.

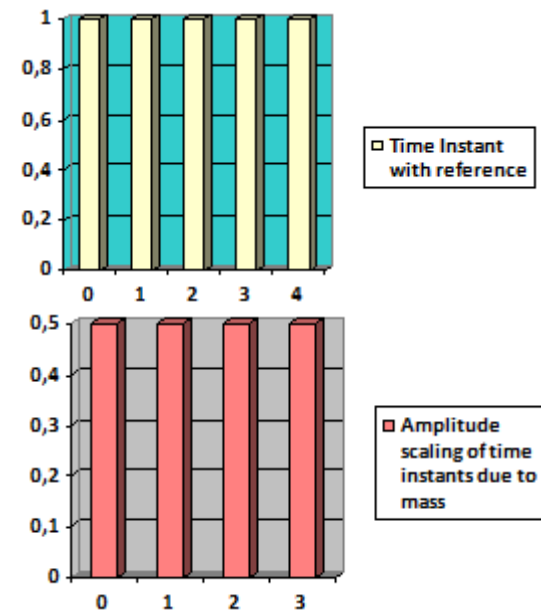


Figure: Amplitude scaling of time under the influence of mass.

The slowdown of the physical time under the influence of mass might be due to some but very few physical time instants are negative (opposite direction) with reference so that, on average, time flow is in the positive direction. The negative time instants make the average time slowdown, and average time is all we understand by our psychology.

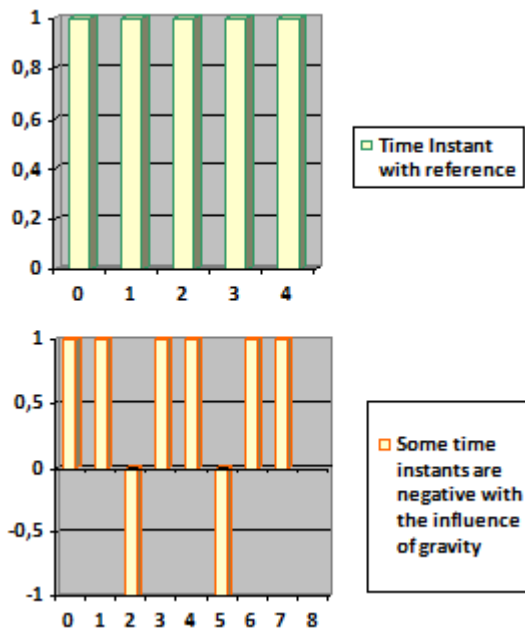


Figure: Some but very few discrete time instants goes negative to lower the average value of time with respect to reference and the time is in positive direction although lower on average under the influence of gravity (mass).

4. Conclusion

There are at least four states of the Universe. Space, mass, energy and time all can be smoothly transformed into one another and vice versa. The transformation constants are all positive and non-linear disregard of states are positive or negative (like mass or anti-mass, energy or anti-energy, space or anti-space, time in forward direction or reverse direction). It implies that the Universe or anti-universe both works with same positive and non-linear constants. The physical time can be slowed down under the influence of mass due to three possibilities. First one is, the frequency scaling of time instants (discrete points of time). As frequency slowdown under the influence of mass, can be termed as down sampling. Second one is amplitude scaling, which allows detrimental amplitude of time instants under the influence of mass. Third and last one is, some physical time instants might be in the reverse direction so that the average physical time over a finite period becomes lower under the influence of mass. We never can recognize time instants but we understand abstract time on average. The four states space-mass-energy-time has chemistry such that everyone tries to cover the imbalance in the other three states to attain super balance condition or perfect equilibrium, in this process, they transform into one another with positive and non-linear state constants. That is the reason, the whole Universe looks like non-linear chaotic in space-time.

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