

Spaces and Velocities

by

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Abstract: Space is what the matter senses as space. Space is not depend on its texture. It can be made out of matter or non-matter. Time is one characteristic of the given space. Using this new approach, we can find substantial spaces that exist in reality, but we have never considered these as spaces. In these spaces the faster-than-light communication is reality. This paper is based on space-matter theory, but it can be understood without knowing this. Space-matter theory describes how space and matter create time. So matter that appears as space appears as time, too. This conclusion is very new, but it is an important part of the space-matter theory.

Key words: double-slit, spooky action, tunneling, space-wave, time-wave, space-matter theory, Lajtner-burger, Lajtner-submarine, more spaces,

1. What is space?

Space is a boundless, three-dimensional extent in which objects and events occur and have relative position and direction.¹ From this definition we don't know what space is made of. Is space a kind of "something" or is it an "empty pool"? Aether theories propose the existence of a substantial medium, the so-called aether that fills this "pool". Aether is a space-filling substance, and a transmission medium for the propagation of gravity forces (and even the electromagnetic force) according to physicists at the end of the 19th and the beginning of the 20th century. The works of Lorentz^{2, 3} represent the theory.

In Einstein's four-dimensional space-time model (three spatial dimensions and one time dimension)^{4, 5, 6, 7 8, 9, 10} space itself is an object that produces action and reaction in harmony with actions of mass (and energy). This four-dimensional space-time has two parts: time and space. What is time, what is space?

Today's physicists claim that time is what we measure as time. What does the phrase "what we measure" mean? Just energy and mass are measurable. The physics concept of measuring time is derived from two "bodies" acting upon each other, where the "bodies" can only be matter – for example, the Earth's rotation in relation to the Sun, the motion of a spring inside a wall clock, or atomic vibration powering an atomic clock. The essence is always the same. One matter moves in relation to another matter. One second is defined as a changing character of the cesium 133 atom¹¹ that we can measure. One second has its start and has its end that we measure. The main element of time is the change. If there is no change, there is no time. We measure changes of matter measuring time.

Can we measure space? Measuring space, we measure matter. The meter is the length of the path travelled by light in a vacuum during a given time interval¹². We can measure neither time nor space at all. We measure only matter. Do we measure all matter? No. Heisenberg's Uncertainty Principle gives us a limit we on what can measure¹³. From now on I refer to matter as 'measurable and immeasurable matter '. Lets say the following: where there is matter, there is no space, where there is space, there is no matter. This definition says three things:

- Space and matter exist, if two objects exist, and one of them acts as space while the other one acts as matter.
- We cannot generally answer the question: "What is space made of?" Space depends on its relationships. Space is what matter senses as space.

- Time originates from the given space.

More details are in Reference¹⁴. There you can find the space-matter theory, too. Understanding the space-matter theory, you may find easy answers of our old physics questions.

2. What can be space; or, Lajtner-submarine

Let's introduce the following notations:

- Space. This is *the* space we know as space, made out of space.
- Time. This is our time generated by mass in Space.
- Space_{act}. This is the space where the object travels.
- Time_{act}. This is the time that is given by the space where the object travels.
- Space_m. This is a space made out of mass that another matter uses as space.
- Time_m. This is the time that is given by Space_m.
- Space wave_L. This is a space wave generated by light.
- Space wave_{MV1}. This is a space wave created by Matter Wave₁.
- Space wave_{MV2}. This is a space wave created by Matter Wave₂.

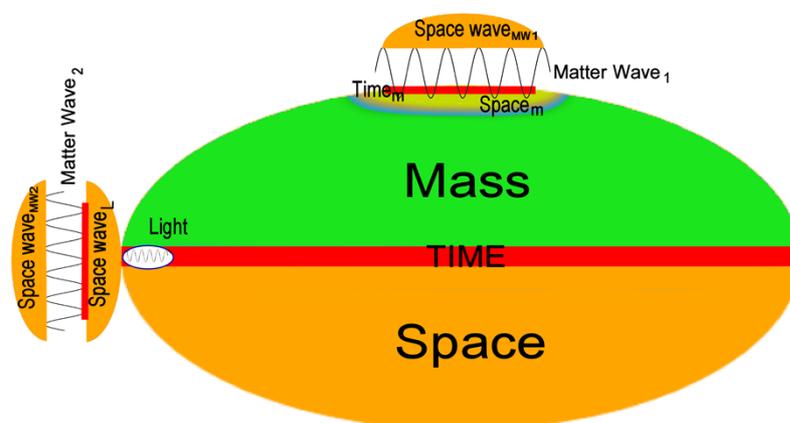


FIG. 1. Spaces of Space-matter model displayed as Lajtner-submarine (not proportional). The illustration sketches the complexity of space and time. It doesn't want to display every possible opportunity. It emphasizes that the question "What is space?" cannot be answered without knowing whose space we speak about.

FIG. 1. shows, there are different spaces. Light and mass are able to generate space, and to appear as space for another matter. Space is a wider category than just "Space", space is always must be understood in relations.

Let's see the top of the figure. It shows, space can be created from mass, it is $Space_m$. Its time is $Time_m$. A given waving matter particle called Matter Wave₁ can travel in Space and in $Space_m$. For Matter Wave₁ $Space_{act} = Space_m$, but the following can be possible, too: $Space_{act} = Space$. In FIG. 4. Matter Wave₁ uses $Space_m$. If the Matter Wave₁ jumps from $Space_{act} = Space$ to $Space_{act} = Space_m$ or back, then the Matter Wave₁ has to change itself, too. Matter Wave₁ creates Space wave_{MW1}.

Let's see the left side of FIG.1. Light travels on the space waves of mass, that is, on our time wave. The light generates Space wave_L used by Matter Wave₂. For example the spooky action at a distance (the non local correlation in quantum entanglement) travels on Space wave_L. The red line here without text symbolizes the time of this space. Matter Wave₂ creates Space wave_{MW2}.

Light itself also can be space, see the fast lights later. Saying this, not only Space, but mass, light and their space waves can be used and are used as space in many cases.

If

$$Space_{act} \neq Space, \quad (1)$$

that is, the wavelengths (λ) are different

$$\lambda_{Space_{act}} \gg \lambda_{Space}, \quad (2)$$

then the velocity of the Matter Wave v_{MW} is grater then the speed of light c ,

$$v_{MW} \gg c, \quad (3)$$

There are many spaces in FIG. 1., but every space and time wave can be derived from the space waves created by masses.

$$\kappa_{act} = \frac{f_{space_{act}}}{f_{Space}} \quad (4)$$

where κ_{act} depend on the given $Space_{act}$ and f means the frequency.

3. Spaces and velocities

Table 1 shows that SPACE can be the lack of matter or even the matter itself. Everything we know (space, mass, energy) can be act as space. Non-space waves can use different spaces; in different spaces they have different velocities. See more in Ref. 14.

| MATTER = SPACE= | Space | Mass | Light (energy) | Spooky action | Tunneling wave | Gravity | Thought force |
|--|-------|---|---|---------------------------|---------------------------|--|------------------|
| Space | ? | $v_{act} < c$ | - | - | - | - | - |
| Mass | ? | Mass can turn into tunneling waves | Light (energy) can turn into tunneling waves | ? | $v_{act} > c$ | - | - |
| Light (energy) | ? | | $v_{act} > c$ | - | - | - | - |
| Space wave caused by mass | ? | - | $v_{act} = c$ | - | - | velocity disputed $v_{act} = c$ | - |
| Space wave caused by light (energy) | ? | - | - | $v_{act} > c$ | - | "gravity" of non-mass, it's refused by physics $v_{act} > c$ | - |
| Modification of Space wave | ? | - | - | possible $v_{act} > c$ | possible $v_{act} > c$ | possible $v_{act} > c$ | $v_{act} > c$ |

Table 1. What can be space? This table shows that both space and matter can act as space. Space and matter seem to be a category that can be understood in relationships only. The relationship determinates the space that determinates the v_{act} , which is the velocity of the non-space object (matter) in the given space. c is the speed of light. Table 1 shows a fact: faster-than-light communication comes into existence many ways. If the space-matter environment changes—that is, matter changes its space, matter's velocity changes as well. I have put the thought force in this table, too. I wanted to stress that thought force appears as a new fundamental force¹⁵. The space-matter theory was constructed in order to describe the force of thought.

If we see the Table 1 from philosophical viewpoint, we can put more questions:

- Fact: Matter is able to act as Space. Is Space able to act as matter?

- What is *the* Space of the void made of?
- Light travels through the dark matter. What kind of space is the dark matter? How big is the velocity of light in this medium?
- Asking this, we may ask: How big is our world?
- Is our Space made out of matter? In this case do the space give more than 95% of the energy of the Universe. Does a different world exist that lies "somewhere under us"?
- Does space exist as a non-matter phenomenon?

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