The Motion of a Natural or Artificial Object in the Light Medium

Before writing anything here, we quote Genesis 1:3/4. Then God said, "Let there be light"; and there was light. And God saw that the light was good; and God separated the light from the darkness.

We would also like to remind the readers of the words of a well-known and respected writer (Christian Courier), Wayne Jackson, "There is nothing at all strange about the reality of light existing independent of the heavenly bodies. It is a well-established fact, illustrated in multiple ways, that "light" certainly is not restricted to the sun and the other luminaries of our universe" [1].

Ever since the existence of humans, they have observed natural and artificial astronomical objects with special interest, and for this, they needed light or, in general, electromagnetic radiation. In other words, these objects had to be luminous, i.e., to emit light or to reflect the light of another relatively nearby emitting natural or artificial astronomical objects (hereinafter astro object).

In our paper [2], we stated that the theory of Special relativity (SR) explicitly supports the contention that light is an absolute frame of reference. According to this theory, the relative speed of a macroscopic object (such as an astro object) υ is defined as the speed of light. Indeed, this speed is measured in units of the light speed c ($\approx 3 \times 10^8$ $m\ sec^{-1}$) $\upsilon = \beta c$, where β is the fraction of light speed c at which the object moves.[1]

The speed of light is invariant and appears in three well-known equations of Special relativity (SR) by which mass (m), time (t) and length (l), and the time (t), length (l), and changes are defined for an astro object while it is moving. These are:

$$\text{the moving mass equation } m = m_0[1/\sqrt{(1 - \upsilon^2/c^2)}] \quad \ldots 1a$$

$$\text{the time dilation equation } t = t_0[1/\sqrt{(1 - \upsilon^2/c^2)} \quad \ldots 1b$$

$$\text{the length contraction } l = l_0[\sqrt{(1 - \upsilon^2/c^2)}] \quad \ldots 1c.$$

where m, t and l are mass, time and length measured by an observer at rest relative to the astro object, usually an Earth observer, and m_0, $t_{0,0}$ and l_0 refer to an observer associated with this object.

For each moving frame of reference with a speed υ ($< c$), there is a reference frame whose speed is higher, except for the "reference frame of light".[2] In the further text of this communication, we will consider the light as an absolute reference frame for the astro objects. Of course, this is not a classical reference frame in which an observer is associated with this frame.[3]

Light from galaxies and other luminous astro objects reaches every point of the observable Universe. Moreover, cosmic microwave background radiation (CMB)[4] fills the Universe from

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[1] β is the ratio of υ to c or $\beta = \upsilon/c$.

[2] Ziefle [1, and references therein] has recently demonstrated that the Special theory of relativity is not compatible with the constancy of the speed of light that we measure on Earth. He suggested that his nonrelativistic concept can explain this constancy and special and general "relativistic" phenomena.

[3] Einstein's thought experiment, where he rode a beam of light, sparked his idea for SR.

[4] In cosmology, the cosmic microwave background is commonly defined as the residual infrared light from the Big Bang event.

every direction with nearly uniform intensity for the last about 14 billion years. In other words, every object in the Universe is immersed in this light and moves in that medium.

In Greek mythology, aither (aether) was the primordial god (protogenos) of light and the bright, blue ether of the heavens. In physics and astronomy of the late 19th century, luminiferous aether was invented to describe a hypothetical medium for the propagation of light. Now we have invented the "light medium" (LM) to study astro objects in the Universe.

The light is an electromagnetic field at rest that spatially oscillates. Therefore, the LM of the observable Universe consists of various electromagnetic fields at rest that spatially oscillate. We know that an electromagnetic field consists of discrete energy particles, photons. Therefore, the LM of the observable Universe consists of various photons, just as air, as the sound medium, contains various gas molecules.

Let us denote with υ the speed of an astro object in the SR space and with υ_L its speed in the LM. Rearranging eqn. (1) and after a bit of algebra eqn. (1) can be written as

$$m^2/m_0^2 = c^2/ (c^2 - \upsilon^2) \quad \ldots (2).$$

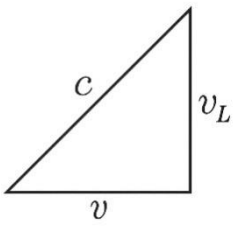
Here, c is not the speed of light but a natural constant which equals $\approx 3 \times 10^8$ *m sec*$^{-1}$ like Planck's constant $h = 6.63 \times 10^{-34}$ *J sec*.

A detailed analysis shows that the equality of the mass of the moving object in the SR space and the LM medium only follows if these three speeds are related by the Pythagorean theorem for a right triangle, Fig. 1a, or if

$$c^2 = \upsilon^2 + \upsilon_L^2$$

or

$$\upsilon_L^2 = c^2 - \upsilon^2 \quad \ldots (3).$$



So, eqn. (2) can be written as

$$m^2/m_0^2 = c^2/\upsilon_L^2 \quad \ldots (4).$$

Indeed, $\upsilon \rightarrow 0$ then $\upsilon_L \rightarrow c$ and $m \rightarrow m_0$. On the other hand, if $\upsilon \rightarrow c$ then $\upsilon_L \rightarrow 0$ and $m \rightarrow \infty$.

Employing a similar procedure, we can derive similar equations for time and length

$$t^2/t_0^2 = c^2/\upsilon_L^2$$

and

$$l_0^2/l^2 = c^2/\upsilon_L^2.$$

Since the moving object cannot reach the speed of light c in the SR space (or $\upsilon < c$) then the maximum limit of υ_L has to be also less than c or $c > \upsilon_L$. In the LM, as an absolute reference system, the speed of an object cannot be zero, but only tends to zero (or $\upsilon_L \rightarrow 0$), i.e., it is always greater than zero (or $\upsilon_L > 0$). In contrast, within the SR framework, the object's speed is zero (or $\upsilon = 0$) in its reference system.

The physicists usually define a non-relativistic astro object in the SR space whose speed $\upsilon \leq 0.1c$. Combining this expression with eqn. (3) we find that in this case, $c > \upsilon_L \geq 0.3c$ or $c > \upsilon_L \geq 3\upsilon$.

The speeds υ and υ_L are equal when they are equal to $c/2$. If $\upsilon < c/2$ then $\upsilon_L > \upsilon$; if $\upsilon > c/2$ then $\upsilon_L < \upsilon$. If $\upsilon \rightarrow c$ then $\upsilon_L \rightarrow 0$.

References

[1] W. Jackson, *What was that "light" before the Sun (Genesis 1:3)?* Christian Courier, https://christiancourier.com/articles/what-was-that-light-before-the-sun-genesis-1-3.

[2] P. I. Premović, *Doppler effect in light, Principle of energy conservation, simultaneity: a uniformly moving physical system*. The General Science Journal.