III. The common interpretation of how an observer at rest experiences the velocity of a "light clock" in a moving inertial system seems not adequate

Fig.1 shows a common interpretation of "light clocks" in Special Relativity from the point of view of the observer O who is at rest. The clock o on the left is at rest, the clock o' on the right is moving with constant velocity in horizontal direction. According to the common interpretation for the observer O at the station, the moving clock o' is supposed to run ("tick") slower than the clock at rest o because the path of the photon seems longer than by the clock at rest. One "tick" of the clock means a photon passes one distance between the two mirrors. [7]

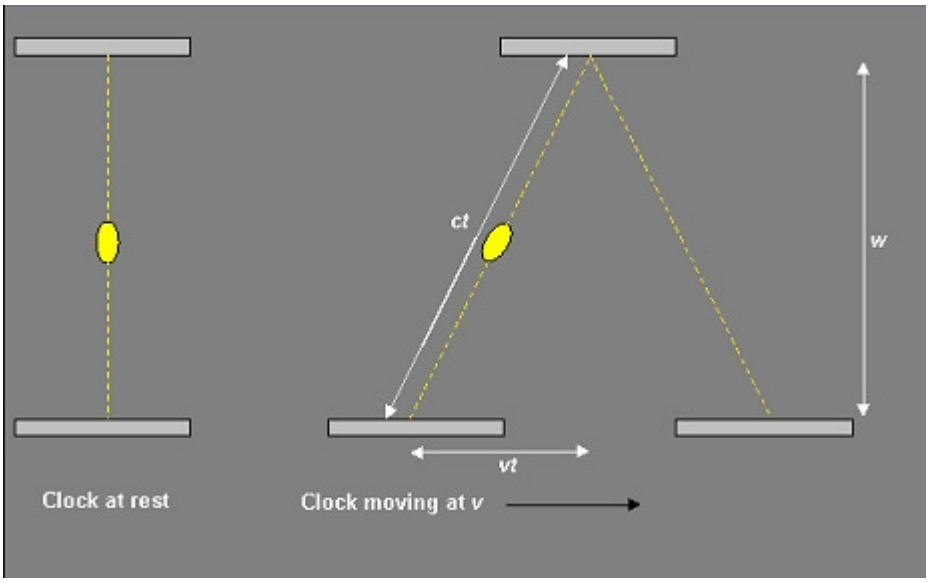

FIG. 1. Two identical light clocks: one at rest, one moving relative to us. The light blips in both travel at the same speed relative to us, the one in the moving clock goes further, so must take longer between clicks. *t* is the time from one mirror to the other.

The interpretation of the authors of this article is the following: the observer O experiences that photon of the moving clock o' has a longer path between mirrors only because the clock o' is moving. This "illusive experience" caused by motion does not mean that for the observer O the moving clock o' will have a slower rate. In the moving clock o' photon moves in a vertical direction and has the same path between mirrors as in the clock o at rest. When we spill water from a glass on board of a flying airplane, water will fall down vertically from the glass. If a ball is thrown perpendicularly towards the floor in a flying airplane, it will bounce back from the floor vertically. Take a sand clock in an airplane. By assuming that air does not provide resistance, the sand will fall down vertically as if it were on the surface of the Earth. Also a photon in a moving clock o' moves in a vertical direction. Out of this the following consequences can be drawn:

a) The photons in a clock at rest o and in a moving clock o' move in a vertical direction.

b) The path of the photons between mirrors is equal in both clocks o and o'.

c) The velocity *c* of photons is the same in both clocks o and o'.

The points a), b), c) are valid for both observers O and O'. This "thought experiment" with clock at rest o and moving clock o' seems to suggest that at the photon scale the "relative velocity" of the physical phenomena in different inertial systems is not valid any more. The "relative velocity" of material changes

starts with the massive particles as it is proved by different decay time of rest pi mesons and pi mesons in motion and by different lifetimes of rest muons and muons in motion. [8]