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THE LIGHT SANDWICH EXPERIMENT AND THE SOLUTION TO POINCARE CURSE

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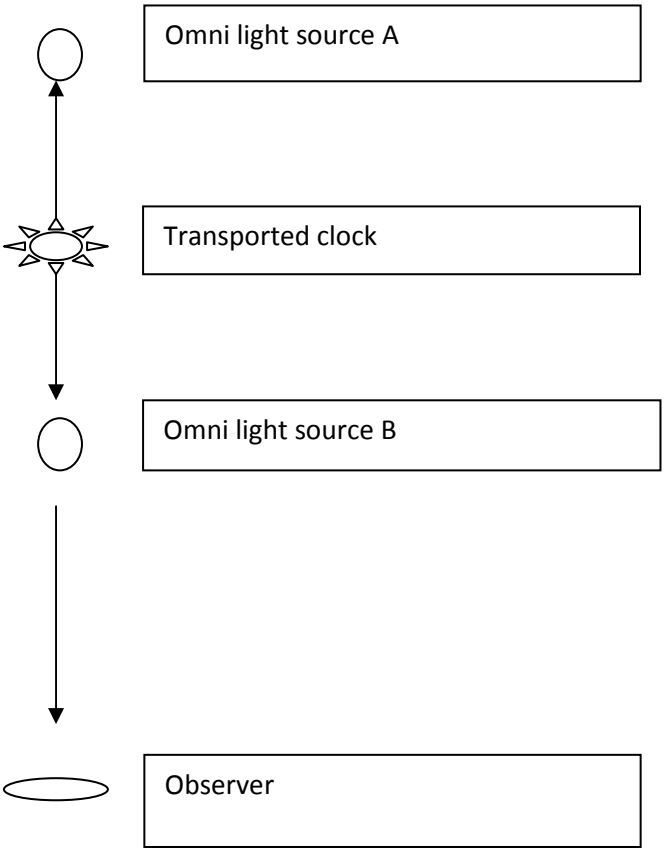
Introduction:

This paper will discuss a possible solution to Poincare's assertion, that the one-way measurement of light is impossible to measure; also known as Poincare's curse. The main problem or obstacle to measuring one way light is how to synchronize two separated clocks[1]. According to Croca, "we could synchronize the two clocks at the same position A, and then by slowly moving the clock B to the final position we could get them calibrated at different positions[2]. According to Mansouri and Sexl, "Nevertheless it was shown that whether this displacement is done in slow motion or in fast motion there is always an indeterminate amount of time necessary to calibrate the clock B"[3]. The usual way to synchronize two clocks is given by special theory of relativity[4]. Nevertheless as shown by Reichenbach and by Selleri there are many other open possibilities compatible with the two-way velocity of light invariance[5]. Since the synchronization of the two separated clocks depend on the theory it follows immediately that the one-way velocity of light, being the relation between the travel path length L and the measured difference in the two times readings, depends also on the assumed theory[6]. It was precisely because of being aware of these basic facts that, back in 1898, Henri Poincare arrived at the conclusion that it was impossible to measure the one-way velocity of light[7].

The Light Sandwich Experiment:

The Light Sandwich Experiment, is named so, because the transported clock is situated exactly between Omni light source A, and Omni light source B; all of which are situated in the line of sight of the observer. (Fig.1)



At time, t=0, the clock is activated and simultaneously sends two signals to Omni light source A, and Omni light source B. Since the clock is stationed exactly in between Omni light sources A and B, Omni light sources A and B are illuminated at precisely the same time at tA and tB. In this situation, whether the clock was transported slowly, or, in a fast manner, does not affect the time at which the clock activates Omni light sources A and B. Since Omni light sources A and B are activated at the same time, meaning tA=tB, the observer stationed some distance away from Omni light sources A and B in the line of sight will be able to measure, physically, the one-way measure of light.

Now according to Croca, the baseline which is needed to perform such an experiment needs to be at least one hundred meters long:

> Even if from the conceptual point of view this is a solid and consistent process for determination of the one-way velocity of light, the concrete experiment need to be done in a large laboratory. This conclusion follows from the fact that the resolution times of the light detectors and of the associated electronics is of about ten nano seconds. In such conditions a pulse of light of for instance one pico second of duration would travel in that time about three meter. So, in order to have some reasonable resolution, the length of the optical medium need to be at least of about one hundred meters long. In order to overcome this experimental necessity it is possible to devise a shorter device to determine the hypothetical one-way velocity of light variation[8].

Conclusion:

According to the special theory of relativity, since Omni light source A is situated further away from Omni light source B, from the observer, Omni light source A will arrive at the observers' station, later in time. In other words, the time of Omni light source A will be greater than the time of Omni light source B.

According to the authors' theory that light is instantaneous, refer authors' paper "The Instantaneousness of Light and the Four Models of Light Measure", www.wbabin.net/physics/gogo.pdf, light arriving from Omni light sources A and B will be observed simultaneously.

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