Commentary on Shafiq Khan's paper: *"Experimental & theoretical evidences of fallacy of space-time concept and actual state of existence of the physical universe"*

Anonymous

(10-July-2018)

Abstract

In his referenced paper (Khan 2012), Khan concluded that Einstein's basic equation obtained in his paper (Einstein 1905) to derive the Special Relativity equations is based on trickery. This paper reveals that Khan conclusion is based on misconceptions and wrong interpretation of the Einstein's derivation method.

Upon checking the referenced paper (Khan 2012), I have been firstly caught up by what seems to be a misconception in regard to Khan's interpretation of the derivation of Einstein's equation

$$\frac{1}{2}\left[\tau(0,0,0,t)+\tau\left(0,0,0,t+\frac{x'}{c-v}+\frac{x'}{c+v}\right)\right]=\tau\left(x',0,0,t+\frac{x'}{c-v}\right),$$

and Khan's counter equation

$$½\left[\tau(0,0,0,t)+\tau\left(0,0,0,t+\frac{2x'}{c}\right)\right]=\tau\left(x',0,0,t+\frac{x'}{c}\right).$$

Understanding Einstein's Approach

In fact, Einstein postulated the speed of light is always measured as c with respect to any observer, regardless of the [uniform, rectilinear] motion of the light source, relative to the observer.

For the considered case in the referenced paper (Einstein 1905), where a light source is at the origin of the "traveling" frame coordinate system $k(\xi,\eta,\zeta,\tau)$, moving at the rectilinear, uniform speed v relative to the "stationary" frame K, a light pulse, emitted from the source (at the origin of the "traveling" system), propagates longitudinally (in the relative motion direction) before it is reflected back by a mirror at rest in the "traveling" frame k, placed at the fixed distance x' (as measured by the "stationary" frame observer) from the origin of the "traveling" system; i.e. $x'=x-vt$ (x is the distance to the mirror from the origin of the "stationary" system $K(x,y,z,t)$).

It is assumed that the light pulse is emitted from the "traveling" system origin at time t, reflected at time t_1, and returned to k origin at time t_2, relative to the "stationary" observer. These time coordinates $(t,\ t_1,$ and $t_2)$ relative to the "stationary" frame system $K(x, y, z, t)$ correspond to the "traveling" system time coordinates $\tau,\ \tau_1,$ and τ_2. The distance x' relative to the "stationary" system $K(x, y, z, t)$ corresponds to the distance ξ in the "traveling" system $k(\xi, \eta, \zeta, \tau)$.

From the perspective of the "stationary" observer in $K(x, y, z, t)$

Based on the above,

$$t_1 \ = \ t + \Delta t_1,$$

where Δt_1 is the pulse travel duration for the way forward, and

$$t_2 \ = \ t + \Delta t_1 + \Delta t_2,$$

where Δt_2 is the pulse travel duration for the way backward.

The light pulse travels (with respect to the stationary observer) a distance of $x' + v\Delta t_1$ on the way forward, and $x' - v\Delta t_2$ on the way backward, always at the speed c. Therefore,

$$c\Delta t_1 = x' + v\Delta t_1;$$
$$\Delta t_1 = \frac{x'}{c-v},$$

and

$$c\Delta t_2 = x' - \ v\Delta t_2;$$
$$\Delta t_2 = \frac{x'}{c+v}.$$

It follows that

$$t_1 = t + \frac{x'}{c-v}$$

$$t_2 = t + \frac{x'}{c-v} + \frac{x'}{c+v}.$$

These are the equations used by Einstein to conclude his basic transformation derivation equation

$$\frac{1}{2}\left[\tau(0,0,0,t) + \tau\left(0,0,0,t + \frac{x'}{c-v} + \frac{x'}{c+v}\right)\right] = \tau\left(x', 0, 0, t + \frac{x'}{c-v}\right).$$

From the perspective of the "traveling" observer in $k(\xi, \eta, \zeta, \tau)$

The pulse is also traveling at the speed c, according to the above speed of light assumption. The pulse is emitted from k origin at time τ, reflected at time τ_1, and returned to k origin at time τ_2 (corresponding to the times t, t_1, and t_2 in the "stationary" frame).

The distance travelled by the light pulse in the forward and backward direction is the same relative to the "traveling" observer's frame k; it is the distance ξ in k, corresponding to x' in K. Hence,

$$\tau_1 = \tau + \Delta\tau_1,$$

where $\Delta\tau_1$ is the pulse travel duration for the way forward, and

$$\tau_2 = \tau + \Delta\tau_1 + \Delta\tau_2,$$

where $\Delta\tau_2$ is the pulse travel duration for the way backward.

$$\Delta\tau_1 = \Delta\tau_2 = \xi / c.$$

Therefore,

$$\tau_1 = \tau + \xi / c$$

$$\tau_2 = \tau + 2\xi / c.$$

Khan's Misconceptions

The equations

$$t_1 = t + x' / c$$

$$t_2 = t + 2x' / c,$$

derived in page 2221 of the referenced paper (Khan 2012), upon which Khan has concluded the equation

$$\frac{1}{2}\left[\tau(0,0,0,t) + \tau\left(0,0,0,t + \frac{2x'}{c}\right)\right] = \tau\left(x',0,0,t + \frac{x'}{c}\right).$$

contradicting Einstein's equation

$$\frac{1}{2}\left[\tau(0,0,0,t) + \tau\left(0,0,0,t + \frac{x'}{c-v} + \frac{x'}{c+v}\right)\right] = \tau\left(x',0,0,t + \frac{x'}{c-v}\right),$$

—which he has called "equation of trickery"—

have no valid basis. In Khan's above equations for t_1 and t_2, it is clearly assumed that the light pulse travels the same distance of x' in the way forward and the way backward, relative to the observer at rest in the "stationary" system $K(x, y, z, t)$, which is obviously not the case, as shown above (the light pulse travels a distance of $x' + v\Delta t_1$ on the way forward, and $x' - v\Delta t2$ on the way backward, at the speed c). If the equations were meant to be from the perspective of the observer at rest in the "traveling" system $k(\xi, \eta, \zeta, \tau)$, then the coordinates τ, τ_1, τ_2, and ξ should be used in place of t, t_1, t_2, and x'.

In summary, Khan's equations

$$t_1 = t + x'/c$$

$$t_2 = t + 2x'/c,$$

are invalid, and should be corrected to

$$\tau_1 = \tau + \xi/c$$

$$\tau_2 = \tau + 2\xi/c.$$

Thus, no "trickery" can be identified in this perspective.

1. Albert Einstein, On the Electrodynamics of Moving Bodies. Annalen der Physik. 17: 891, 1905.
2. Mohammad Shafiq Khan, Experimental & theoretical evidences of fallacy of space-time concept and actual state of existence of the physical universe. Indian Journal of Science and Technology. 5(3): 2217-39, 2012. Posted on viXra with the link: http://vixra.org/abs/1201.0022