A critique on the spatial calculations (of e.g. the type being made by Ronald van Elburg) involved in the contradiction of the OPERA experimental anomaly

ir. Etienne Brauns 29 October 2011

Dear OPERA researchers,

according to news reports on the internet, the calculations made by Ronald van Elburg of the University of Groningen (e.g. http://www.technologyreview.com/blog/arxiv/27260/) regarding the OPERA experiments related anomaly are claimed to be a possible explanation, thereby saving Einstein's theories. Moreover, still according to Ronald van Elburg's calculations, it would be even special relativity that would be the basis of the contradiction.

I would however like to point to the fact that any attempt to contradict the anomaly that was detected in OPERA, through trials such as the one by Ronald van Elburg, are bound to fail as the result of a fundamentally wrong premise. Therefore please take some time to read carefully the full reasoning in this text since the seemingly "simple" basics at the start indeed end up in revealing a tremendous flaw in the human's perception and use of the mathematical based concept "space (x,y,z)", as created an practiced by the human mind. The reasoning will prove to you an extremely important shortcoming of that mathematical concept in the case of the description of light phenomena (even in general : electromagnetic phenomena). By reading until the very end of this text you will experience a profound Gestalt Switch with respect to the classic (x,y,z) approach. An approach that scientists are using (also Ronald van Elburg) but erroneous (inaccurate) when describing specific phenomena in physics.

A number of methods that are and will be used to contradict the OPERA related anomaly, will be based on the time interval that an information carrier needs, in order to travel in real space from the information source to the information receiver. E.g. in the case of a electromagnetic signal that travels from a satellite to a receiver on earth, as Ronald van Elburg is describing.

I will use photons in my further reasoning.

Thus, have a look at the next "simple" example of a photon as an information carrier and which is send by a source (e.g. a laser). I do not use any figure first as a graphical representation to explain the example. I will only use the linguistic representation approach since you can easily build the situation of the "simple" example in your mind, without a graphical representation.

The source is assumed to travel in real space at a constant velocity v and on a perfect linear track, which is called x (also x-direction).

Consider also a receiver :

- travelling exactly at the same velocity v through real space

- also on a perfect linear trajectory

- the linear trajectory of the receiver is perfectly parallel to the trajectory of the source. Photon source and receiver travel in the same direction (thus not in opposite directions).

- the receiver is located in space perfectly situated perpendicularly above the source's position. So xR(t)=xS(t) is valid at all time instants

A photon is sent by the source at time t=t1=0 in a way that the photon travels in real space in a direction perfectly perpendicular to the x-direction. We call the direction perpendicular to x the y-direction. We define the location of the receiver xR(t1)=0 at t=t1. Also the location of the source xS(t1)=0 at t=t1.

Let us assume that the distance (in the y-direction) between the two trajectories is 300 km. The photon crosses the trajectory of the receiver at time t=t2. The photon will need a time interval of (t2-t1) sec to travel the 300 km. Evidently t2-t1=0.001 sec (when assuming the speed of light c=300 000 000 m/sec).

Let us assume that v=30000 m/sec.

First question : what is happening to the location of the receiver during that time interval of t2-t1= 0.001 sec which the photon needs, to bridge the 300 km distance ? Answer : it is trivial that the receiver will have travelled in real space, as a result of v=30000 m/sec, over a distance of 30 m. As a result the photon does not get to the receiver... Indeed, the receiver's location xR(t2)=30 meter at t=t2. The photon crosses at t=t2 the receiver's trajectory at the receiver's past location xR=0 ! It is clear that, in order to meet the receiver, a photon as an information carrier should have been targeted by the source slightly off-angle from the y direction in a way that the photon will meet the receiver. The sending-receiving situation is thus in reality more complex and the off-angle would need to be calculated in more detail. It is evident that the information carrier (the photon) also will need to travel a slightly larger distance than the exact 300 km as a result of the required off-angle situation if the receiver is intended to receive the information carrier.

Second question : what is happening to the location of the source during that time interval of t2-t1=0.001 sec, which the photon needs to bridge the 300 km distance ? Answer : the source will also have travelled 30 m of course in a way that xS(t2)=30 meter at t=t2.

At this stage, both questions and answers may look trivial (although some of you maybe have not reflected directly about the requirement of an off-angle sending of a photon (in this example) in order for the moving receiver to intercept the information carrier (the photon in this case)). In the next part of the reasoning things are getting however much less trivial ...

What is the importance here of all these "simple" calculations and "trivial" linguistic phenomena representations ? Please read further since it will become clear that these "simple" calculations and linguistic phenomena representations are able to reveal a really fundamental error in the contemporary (x,y,z) graphical representations and the so-called "reference frames" linked to that (x,y,z) concept, existing within the human mind.

It is not feasible to present in this text a dynamic representation (figure) of the photon phenomena but therefore make sure to have a look at www.absolute-relativity.be/node/4 where you first should directly scroll down towards section 3.2.1 and where you then can find a dynamic Figure 9 which shows much better what happens to a photon which is sent by a source. The frame (xObs1, yObs1) is the frame of an observer Obs1 at rest in real space. The frame (xObs2, yObs2) is the frame of an observer Obs2 moving along with her/his frame in real space. Next have also a look at figure 10. The

source S is located in the origin of the reference frame of Obs2. The situation is "depicted" for t=t2. Photon i arrives at t=t2 in the location F while photon j just departs in S (thus at t=t2). If M would be considered in this text as the location of the receiver you can see what happens to the photons which are sent from S in a perfect y-direction. Those photons will not arrive in M since M also moved in space, as explained. In the example presented here in this text the distance between M and S would be 300 km. The distance between M and F would then be 30 m.

The trivial aspect is now disappearing quickly since a dramatic and clear consequence of the representation within figure 10 is that the location (xObs2, yObs2)=(0,0)="S" (the origin of the frame of Obs2 who is moving along with her/his frame in real space) certainly cannot be considered any longer by the observer Obs2 as the location where Photon i was launched at t=t1 (thus in the past) in real space. The up to now used but wrong premise by scientists that S always IS the launching position of each photon in the (moving) frame of (the moving) Obs2 is finally fully exposed ! That location of the launch of Photon i is situated in real space in the dotted location (situated under F) ! SF is thus also not the trajectory of Photon i (even not in any of both reference frames) ! This certainly needs a profound Gestalt Switch from you but please think about this very, very carefully as a scientist with respect to the consequences : **in a moving reference frame, it is simply impossible for the observer Obs2 (who moves along with his reference frame) to graphically represent correctly the past position of Photon i(t1)** ! ... Neither S as a "S equals to (xObs2, yObs0)=(0,0)" location in the (xObs2, yObs2) frame and neither the dotted point in figure 10 (which would be merely symbolical in the (xObs2, yObs2) frame). There is thus clearly a fundamental flaw in the contemporary approach in physics to describe light phenomena through a reference frame (whatever two-dimensional (x,y) or three-dimensional (x,y,z)) **which is moving in real space**. This is a fundamental error which was never accounted for and which urgently needs to be resolved. The premise of a correct (x,y,z) space concept is clearly flawed in the case of photon phenomena. The situation in contemporary physics with respect to photon phenomena could be described as an upside-down situation : from the new point of view, real light phenomena seemingly "have been forced" in contemporary physics to comply with an artificial mathematical (x,y,z) space approach instead of having it the other way around... Photons evidently do not travel in an artificial mathematical (x,y,z) space but only in the one and single existing real space. A statement such as "Photon i moved along the trajectory SF in the reference frame (xObs2, yObs2) of the moving observer Obs2" (Figure 10) is simply totally wrong ! In contemporary physics moreover it is believed that a photon send in the perfect y direction will arrive in M and that is totally wrong on our planet (see the note below !!!). Those contemporary paradigms are thus based on the wrong (x,y,z) related premises in the case of light phenomena (and other electromagnetic phenomena). This flaw should be cleared ASAP in physics.

Please have a detailed look at this and to all additional consequences (e.g. regarding the Michelson and Morley experiment) which are described at the website. You can also find the description of the, up to now, unaccounted error issues concerning surveying applications in a pdf document (Part II_B) which you can download at the top of http://www.absolute-relativity.be/node/5 . I am sure that there must be a link to the OPERA detected anomaly and certainly is a basis to reject the calculations by Ronald van Elburg (and in principle all other calculations where electromagnetic information carriers are involved and where the (x,y,z) space approach is used ; even relativity based calculations since relativity theories themselves suffer from the same (x,y,z) problem, presented here, when

dealing with electromagnetic information carriers and therefore relativity theories of course do need to be reconsidered themselves !) .

Note :

- experimental proof is even available since a laser experiment was performed of which the results are shown in figure 2 at www.absolute-relativity.be/node/3 . It is indeed clear that a sender and a receiver fixed on the surface of our planet show a synchronous motion through real space since our planet travels at 30000 meter per second through real space. Moreover our planet presents an ideal experimental environment since it shows a 24 hours rotation. The velocity vector v thus can be considered to cycle during the time interval of 24 hours. The background and result of the laser experiment are described in detail at the website)

- I observed thus another anomaly through a laser experiment. When confirmed, there is evidently a lot of work lying ahead with respect to contemporary paradigms in physics... The realization that the "space" concept (x,y,z), as invented by the human mind, should be considered only as an artificial tool itself but which moreover shows an internal fundamental flaw in the case of the description of light phenomena and which was never realized before is of extreme importance. Until now, no one else seems to have thought before about that intrinsic (x,y,z) error source possibility. In fact (x,y,z) is a (highly intelligent) spatial "counting" model/tool (counting of coordinates) which is extremely successful in science (I myself e.g. use finite element multiphysics modeling in my research) but until now scientists have been doing that "counting" in a wrong way with respect to an accurate description of light phenomena. In high accuracy applications, science definitely needs to redefine the tool (x,y,z) in order to even better approximate e.g. photon related phenomena in real space and to "really save those phenomena" (really in the meaning of "reality"). As indicated and up to now, light (or electromagnetic) phenomena are not accurately saved by that (x,y,z) tool yet.

Best regards,

ir. Etienne Brauns