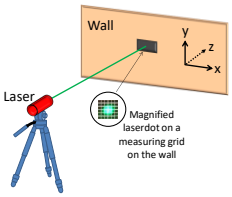

On a significant systematic measurement error during photon based theodolite observations and also during hunting rifle scope based targeting.

Short and private communication/publication

Etienne Brauns[a]

1.0

Keywords: theodolite, surveying, scope, location, anomaly, paradigm, light, ray of light, laser, laser pulse, laser beam, photon, real space, real velocity, real location, apparent location, hunting rifle, telescope, targeting

Abbreviations: CS (contemporary science), CPBD (contemporary paradigms believer and defender), RS (real space), RV (real velocity), MWF (My Website Figure ; including references to dynamic Figures through an internet web link since it is not possible to directly implement dynamic/animated time stamp type of Figures in a Word or PDF format based static publication/document)

Figures: dynamic Figures in this publication are referred to as e.g. MWF2 (see Abbreviations). By clicking the link in Table 1 those dynamic figures will automatically open in your web browser.

Table 1 : MWF figures and their link

	Link
MWF1	www.absolute-relativity.be/figures/Figure01.gif
MWF2	www.absolute-relativity.be/images2/G6_Animation.gif
MWF3	www.absolute-relativity.be/figures/Figure03.jpg
MWF4	www.absolute-relativity.be/figures/Figure04_Animation.gif
MWF5	www.absolute-relativity.be/figures/Figure05_Animation.gif
MWF9	www.absolute-relativity.be/figures/Figure09_Animation.gif
MWF23	www.absolute-relativity.be/figures/Figure23_Animation.gif
MWF24	www.absolute-relativity.be/figures/Figure24_Animation.gif
MWF25	www.absolute-relativity.be/figures/Figure25_Animation.gif
MWF26	www.absolute-relativity.be/figures/Figure26_Animation.gif
MWF27	www.absolute-relativity.be/figures/Figure27_Animation.gif

a) Private research contact : all contacts should go through the Contact facility at the Home page of www.absolute-relativity.be

1. Abstract

In previous publications (1,2,3) (see the references below at the end of this Abstract) the experimental result of a straightforward laser experiment was discussed, thereby supporting the claim of the existence of a massive anomaly within CS with respect to the CS linked description of light (photon) phenomena in RS. In this short publication/communication some of the important practical consequences are discussed, regarding two applications on our planet. As a first application: theodolite measurements clearly will show a systematic error since being based on the use of photons which are subject on our planet to the lateral effect as described in detail and shown by experiment (MWF2) within (1,2,3). The considerable lateral systematic error can be of the order of 2 mm for a distance of 10 m between theodolite and surveyed object (thus 2 cm for a distance of 100 m ; 20 cm for a distance of 1000 m !). In a total analogous way it is obvious that the same type of systematic error is induced during hunting rifle scope targeting since such (tele)scope targeting is also based on the use of photons as a source of information on the location of the hunted target. It should be noticed that strictly and only a governmental laws regulated/allowed and sustainable/subsistence hunting is considered in this publication.

Note : the principle and result of the laser experiment was already published in a (notary registered) patent text and also published at www.absolute-relativity.be. In addition, a detailed discussion can be found within the extended publication (1)* of over 400 pages which is downloadable at the indicated website. The extended publication is informing in much more detail about the existence/proofs of multiple flawed paradigms within CS as well as about important applications (on our planet and in space) resulting from those views. All information and contents related to (1), (2), (3) and the website were registered in front of a notary and, in combination with the patent text, thus ensuring an author's copy right protection.

(1)* Etienne Brauns, *A shattered Equivalence Principle in Physics and a future History of multiple Paradigm Big Bangs in "exact" science ?* ; this extended (notary registered) publication can be downloaded at http://www.absolute-relativity.be

(2) Etienne Brauns, *On multiple anomalies and inconsistencies regarding the description of light phenomena in contemporary science*
Website : http://www.absolute-relativity.be/pdf/MultipleAnomalies_EBrauns.pdf (version including the Annex)
Researchgate :
https://www.researchgate.net/publication/312190993_On_multiple_anomalies_and_inconsistencies_regarding_the_description_of_light_phenomena_in_contemporary_science
https://www.researchgate.net/publication/312591154_Annex_1_to_On_multiple_anomalies_and_inconsistencies_regarding_the_description_of_light_phenomena_in_contemporary_science

(3) Etienne Brauns, *On a massive anomaly through a straightforward laser experiment falsifying the equivalence principle for light.*
Website : http://www.absolute-relativity.be/pdf/ExperAnomLaser_EBrauns.pdf
Researchgate :
https://www.researchgate.net/publication/313030370_On_a_massive_anomaly_through_a_straightforward_laser_experiment_falsifying_the_equivalence_principle_for_light

2. Introduction

Theodolite surveying measurements are based on light/photons. The principle of a theodolite measurement can be found on the internet, e.g. https://en.wikipedia.org/wiki/Theodolite. A theodolite uses the photons travelling from the surveyed object to the theodolite through RS, then arriving at and travelling through the theodolite scope. These photons carry the information about the surveyed object, being located at a distance from the theodolite. A photon which departed at a time instance t_1 from a specific point at the observed object's surface must travel first through RS to the observer's surveying instrument (theodolite). A photon Ph_j moves at the very high speed of light but still needs a definite time to travel from the observed object to the theodolite. That travelling time is evidently not zero. The photon Ph_j will thus arrive at the theodolite at the time instance $t_2>t_1$.

On arrival, all photons (carrying the image information of the overall surface of the surveyed object) are processed in order to generate the spatial coordinates of a specific observed point at the object's surface. A theodolite is based on angular measurements. Up to now the coordinates calculation algorithms do not consider the systematic transversal surveying error, being linked to the travelling time of a photon Ph_j from the point of emission at the observed object's surface, towards the surveying instrument during which the surveyed object evidently also moves in RS (it should be very clear here to the reader that our planet of course moves through RS at a very high velocity and thus also all objects so-called "at rest" on the surface of our planet). In this publication, that systematic theodolite surveying error is explained, as resulting from the views being shown in detail in (1,2,3), from theory and as proven experimentally from a laser experiment. In the CS based classic approach of modeling light phenomena, it is common to graphically represent ("model") a "ray of light" as a straight line, connecting the observed point of the object to the lens of the surveying instrument. In such CS model, ALL (departing, travelling and arriving) photons of the family Ph_j are thus claimed by CS to be located on the trajectory represented by a single geometrical line. In (1,2) it is theoretically shown, while being proven experimentally in (1,3), that the CS based simplistic "ray-of-light" model is totally flawed and certainly in the case of high accuracy intended measurement techniques such as high accuracy theodolites. For low accuracy applications such CS approach can be considered as acceptable but this is certainly not the case for theodolite measurements.

In an analogous way the accuracy during hunting rifle scope targeting is also subjected to the very same type of systematic error. Since in specific regions in the world, (governmental laws regulated sustainable) hunting is still a fundamental basis as a food source for many people, the views within this publication can be of substantial importance. The calibration of the hunting rifle scope should be additionally based on those views since the systematic scope targeting error for long distance targets, induced by the effect as discussed within this publication, can be up to the order of 10 cm for a distance of 500 m (error being proportional to target distance, thus 20 cm for 1000 m).

The effect is also rather straightforward to understand : the image of an object that is observed

is based on the information extracted from the photons travelling from the object towards the observer. The photons need a specific travelling time through RS to cross the distance between the object and the observer. The observer thus receives information from the past with respect to the real location of the object in RS. Since the orbiting velocity through RS of our planet around the sun is already 30000 (!) metres per second, our planet (while including the object and the observer) have also moved through RS during the travelling time of the photons through RS from the object to the observer. The observer therefore needs to correct that obtained information, as extracted from the photons, on the object's old real location in RS into the actual real location of the object in RS. Nevertheless the small travelling times for photons to travel from an object situated on our planet (so-called "at rest") with respect to an observer (also so-called "at rest") on our planet: the observer will observe an image of the object linked to an apparent location of the object which does not correspond at all with the actual real location of the object in RS. Therefore the systematic surveying error regarding that actual real location of the object in RS should be clear to anyone. As a result of the very high orbit velocity of our planet in RS the error is significant and cannot be ignored in high accuracy applications such as the two applications discussed in this publication.

3. Theoretical and experimental background

The notion real space (RS) in this publication has the following meaning: all celestial objects such as e.g. the planet earth and the sun are evidently located in RS. Our planet is in orbit around the sun and thus moves through RS around the sun. Satellites also orbit around our planet and thus move through RS. The space ship Voyager 1 moves through RS and at this moment even in RS outside our solar system. On the scale of an atom : electrons orbit through RS around the nucleus of the atom. All material objects in fact are located in RS : in (1) a somewhat more detailed discussion can be found in that respect. Since an atom nucleus consists of neutrons and protons it is indicated e.g. in (1) that, from the point of view of the extremely small volume of protons and neutrons, building the very small individual atom nucleus, the summed intrinsic volume of the protons, neutrons and orbiting electrons of an atom constitutes an extremely small fraction of the total geometric volume of the atom. From a geometrical point of view an atom's geometric volume thus shows an occupation of that geometric volume by over 99.999999999 % of RS ! Therefore in general, since all material objects are build from atoms the geometric volume of a material object is mainly occupied by RS. A material object which moves <u>through</u> space thus has the literal meaning that all electrons, protons and neutrons reside in RS and move simultaneously <u>through</u> RS.

Since (even Einstein proved that) light consists of photons the notion "light moves through RS" should be interpreted as "photons move through RS". Moreover, in this publication the movement of photons through RS is considered to be very specific, conflicting with CS views for that matter. The reader is therefore urgently referred first to (2,3) in which the inconsistencies and anomalies within the views of CS regarding photon/light phenomena were already revealed and discussed. The CS based figures MWF27/MWF26/MWF25 (figure links are also here in Table 1) as well as the CS based MWF24 already demonstrated such. Figure

MWF23 was presented in (1,2,3) as to indicate a more consistent basis as a model approach in contrast with the flawed CS views based MWF24 (the latter as a CS graphical representation in a virtual/mathematical representation of RS of the photon phenomena, not saving at all the real photon phenomena and falsifying the ray-of-light concept/model). In addition the dynamic presentation within MWF9 of the individual trajectories of the photons from a moving laser/light source were illustrated as well, in contrast with the anomalous CS view as represented by MWF5 (thus in fact MWF1 in the case of a CS type of "reference frame" moving in RS). Within MWF9 the "red" photon was considered as a "tracer" photon, thereby enhancing the interpretation of the trajectory of a photon. MWF3 and MWF4 illustrated this further, also in contrast with the anomalous CS views as represented by MWF5/MWF1/MWF25/MWF26/MWF27/MWF24. This all gives the reader the theoretical and experimental background with respect to the views within this publication since MWF2 represents an experimental proof by a laser (see below).

Evidently in the case of a theodolite, while surveying an object at a distance, such involves the theodolite as being considered by CS to "be at rest" since the theodolite supporting tripod is "at rest". Likewise, the surveyed object is also considered by CS to be "at rest". Both theodolite and object thus do not move with respect to one another according to CS. Such situation is thus fully analogous to the situation within the laser experiment as described in (3) within section 3 "*An experimental massive anomaly*" and shown again in Figure A.

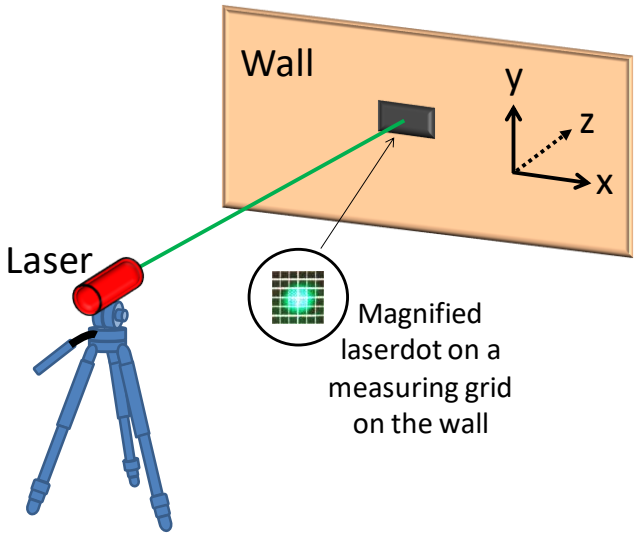

Figure A : a fixed laser sending a laser beam to a fixed wall in a room

As reported in detail in (1,3) the laser dot on the measuring grid at the wall (Figure A) is NOT at a fixed location during a 24 h experiment. CS considers the laser and wall (measuring grid) to be at rest to one another and then claims that the laser dot at the wall also needs to be in a fixed ("at rest") position at the measuring grid but such claim by CS is totally flawed. It is explained in (1,2,3) that our planet's extremely high orbiting velocity vector (orbit in RS around the sun) having a scalar value of already about 30 km/sec (!) has a major effect on the

location position of the laser dot on the measuring grid at the wall. The experimental result was reported on (and also shown in MWF2).

As discussed in (1,2,3) the photons travelling from the laser towards the measuring grid at the wall need a specific travelling time through RS before arriving at the measuring grid. The speed of light is about 300,000,000 meters per second. The travelling time Δt of a photon over a distance of e.g. arbitrarily 10 m is 0.0000000333 seconds : seemingly very small but certainly not zero. Such travelling time value looks deceivingly small and totally negligible but such is certainly not the case ! In the case that the laser beam direction would be perpendicular to the earth's orbit velocity vector (scalar value to be reported to be 30,000 meters per second), the measuring grid will have moved in RS during that time interval Δt=0.0000000333 seconds over a distance of 0.0000000333 sec x 30000 m/sec = 0.001m = 1mm (!) within the plane of the measuring grid. In the case however that the laser beam direction would be parallel to the earth's velocity vector the measuring grid will have moved in space over a distance of 1 mm during the time interval Δt, but then perpendicular to the measuring grid's plane (thus in the z-direction). Therefore it is clear that during a time interval of 24 hours, during which our planet shows a complete rotation, the laser beam direction within the set-up of Figure A will continuously change with respect to the earth's orbit velocity vector direction. As a result, during that time interval of 24 hours the laser dot will therefore not be in a fixed location at the measuring grid as claimed by CS but its location on the measuring grid will show a Lissajous type of oscillation. Indeed, the trajectory/travelling direction of the photons through RS from the laser towards the measuring grid could be :

a) perpendicular to the earth's orbit velocity vector at a time instance t
b) parallel to the earth's orbit velocity vector at a time instance t+6h
c) mirrored perpendicular to the earth's orbit velocity vector at a time instance t+12h
d) mirrored parallel to the earth's orbit velocity vector at a time instance t+18h
e) back to the situation of a) at time instance t+24h

The 24 h based laser experiment was performed multiple times (at different days) and the theory was indeed confirmed by experiment. For details on the set-up, discussion and the result of such (multiple and reproducible) straightforward real laser experiment(s) the reader is referred to Chapters 10 and 11 in (1). The expected dynamic lateral shift of the laser dot location on the measuring grid was obvious. Other 24 h observations showed the exact same phenomena. In these experiments, the laser beam was horizontally (parallel with the earth's surface) directed towards a vertically (perpendicular to the earth's surface) positioned measuring grid at a distance of 10 m in the East-West direction (location : Belgium, Mol, 51° 11' North , 5° 06' East). Since the experiments were performed during the month of June, the main amplitude of the laser dot Lissajous type of displacement on the measuring grid was in the y direction of the measuring grid. This was fully consistent with our earth's spatial position with respect to the sun, thus fully consistent with the high solar noon position in the sky in that month at the location (Mol, Belgium) of the experiment.

It is thus evident that the significant lateral effect of the laser dot at the measuring grid as

experimentally shown by MWF2 also needs to be considered within theodolite measurements or hunting rifle scope targeting. The basics of this all are explained briefly in 4.1 and 4.2. It should be mentioned here that the implementation of correction algorithms (in order to correct for the explained lateral shift) will need the input of the local data regarding our planet's RV vector. Within (1) basic information is provided about the concept of a RV (real velocity) measuring device in RS (real space) and reference is made in (1) to a patent text in that respect. It is mentioned in (1) also that only an intense cooperation within a team of expert researchers and industrials in the domain of optics (including high precision lenses, mirrors and photon sensors), mathematics, electronics and instrument building will be able to lead to the development of a RV measuring device. The importance for other practical applications are indicated in (1) as well in that respect.

4. Theodolite and scope surveying errors resulting from our planet's high velocity in RS

4.1. Theodolite measurements

Assuming for the case of a theodolite surveying instrument (after a local calibration procedure before its use):

- that the instrument's calibration would be corresponding to a time instance where the trajectory direction of the incoming photons would be perpendicular to our planet's orbit velocity vector in RS. Our planet is assumed to be in a rotational status linked to that time instance "t". It should be noticed that for each location on our planet's surface such status in reality will be different: the angle between the direction of the earth's velocity vector and the measurement direction (between the theodolite and the observed object) is indeed a very complex parameter which needs to be determined at each location (vector analysis). Here the most disadvantageous angle (perpendicular) between both directions is assumed, in order to determine the maximum error value.
- our planet's orbit velocity value as a basis for an estimate of the maximum systematic measuring error
- the instrument is then used at a time instance "t+12h" at the very same location and in the very same position

Under such conditions a considerable lateral systematic measurement error can be expected, of the order of maximum 2 mm (most disadvantageous situation) for a distance of 10 m between theodolite and surveyed object (thus 2 cm for a distance of 100 m ; 20 cm for a distance of 1000 m !). A lateral error up to about 0.002 m for a distance of 10 m corresponds to an angle error up to about 40 arcsec which can be easily detected by modern sophisticated theodolites since those even are claimed to have a resolution of 1 arcsec for the highest accuracy ones. Likewise two same measurements with the same theodolite at the same location but differing 12 hours between both measurements can show in the most disadvantageous case a difference between the two measurements of up to 40 arcsec !

The detailed analysis of the error and the development of new measuring procedures and

algorithms is of course not the subject of this publication as a result of the very high complexity of such analysis. Such also requires the development of the suggested RV measuring device which is able to determine our planet's RV vector in RS at a specific location on our planet's surface (since that vector is location depending). As already indicated, this all will demand a substantial research and development effort of a complete team of mathematicians, software specialists, optics experts, instrument experts, electronics experts, etc. As a first step and as called for within (1,2,3), a re-performing of the laser experiment corresponding to the type of set-up as indicated within Figure A and discussed within (1,2,3) at a university or a research centre would first confirm the views within (1,2,3) and within this publication. After a confirmation of those laser experimental results from the type of set-up shown within Figure A (see the recommendations in (1) regarding an improved set-up) and demonstrated within MWF2, the scientific environment should of course be triggered to progress further and to consider and develop the suggested improvements towards the accuracy within high accuracy theodolite measurements. This should evidently stimulate and initiate the development of significant correction algorithms in high accuracy theodolite surveying practice.

It will also make very clear that multiple flawed paradigms (based on light phenomena) exist in CS. CPBD's of course will state (see 1,2,3) on the basis of CS paradigms on light that a photon inherits the tangential/lateral velocity vector component but, when asked, those CPBD's have failed up to now to explain the mechanism by which a photon:

- strangely can inherit, according to CS views, the light source velocity vector component perpendicular to the trajectory of the photon
- is however, according to CS views, unable to inherit any of the light source velocity vector components being non-perpendicular to the trajectory direction of the photon !

CPBD's simply hide in silence regarding that question about the physical mechanism of that extremely peculiar principle, as claimed by CS. This hiding in silence attitude is shown in (1) and specifically reported on in Chapter 13 of (1). However, the inconsistencies and anomalies resulting from those CS paradigms based on light are shown/proven theoretically and experimentally in (1,2,3). No CPBD seems to be able to counter these anomalies and moreover to counter the experimental laser result (MWF2), only resulting again in silence. Possibly an action, as a result from the contents of 4.1 and 4.2, by the research and development people directly involved with the practical aspects of both domains, could lead to an independent verification of the novel views within (1,2,3) being followed thereafter by a general acceptance of these views and moreover, leading to the correction and/or even total abandoning of flawed specific CS paradigms based on light.

4.2. Hunting rifle scope based targeting errors

In the case of hunting rifle scope based targeting the same type of error exists. The hunting rifle scope is calibrated at a specific time instance "t" at a specific location in a specific direction.

Assuming in the very same way (see 4.1) but now for the case of a hunting rifle scope:

- that the scope's calibration would be corresponding to a time instance where the trajectory direction of the incoming photons would be perpendicular to the earth's velocity vector in RS (the most disadvantageous situation). Our planet is assumed to be in a rotational status linked to that calibration time instance "t". It should be noticed again that for each individual location on our planet's surface such status in reality is different: the angle between the direction of the earth's velocity vector and the surveying direction (between the scope and the hunted target) is a very complex parameter which needs to be determined at each location. Here also the most disadvantageous angle (perpendicular) is assumed to determine the maximum error value.
- our planet's orbit velocity value as a basis for an estimate of the systematic measuring error
- the rifle and scope are then used at a time instance "t+12h" at the same location and for the same (calibration) target at the same distance

Under such conditions a considerable lateral systematic scope viewing error can be expected, of the order of maximum 10 cm for a distance of 500 m between hunting rifle scope and target (the error is proportional to distance thus maximum 20 cm for a distance of 1000 m). As a result and in the case of the assumed most disadvantageous calibration conditions at time instance "t" the "calibrated" rifle scope will also show a systematic targeting error of 10 cm for a distance of 500 m when firing the rifle directly after the calibration in an opposite direction (error value is evidently firing direction depending) at the same location. Notice of course that the detection of the lateral error is not restricted to the horizontal case (parallel to the earth' surface ; left/right error situation) but evidently also in the vertical case (vertical to the earth's surface ; up/down error situation). Reference can made regarding the latter to the mainly vertical effect within MWF2, being very consistent with the theory.

As indicated in 4.1 but repeated here specifically for the rifle scope case: "*The detailed analysis of the scope error and the development of correction procedures/algorithms is of course not the subject of this publication from the very high complexity of such analysis. Such also requires the development of the suggested RV measuring device which is able to determine our planet's RV vector in RS at a specific location on our planet's surface (since that vector is location depending). This all will demand a substantial effort of a complete team of mathematicians, software specialists, optics experts, instrument experts, electronics experts, etc. As a first step and as called for within (1,2,3), a re-performing of the laser experiment corresponding to the type of set-up as indicated within Figure A and discussed within (1,2,3) at a university or a research centre would first confirm the views within (1,2,3) and within this publication. After a confirmation of those laser experimental results from the type of set-up shown within Figure A (see the recommendations in (1) regarding an improved set-up) and demonstrated within MWF2, the scientific environment evidently should of course be triggered to move further and to consider and develop the suggested improvements. This would result in a significant improvement in rifle scope correction procedures and algorithms*

in the case of wide range rifle hunting (for food situations under existing governmental laws regulated and sustainable hunting). "

The situation in observing an object from a distance by eye or scope can also be described as following. The photons need a specific time to travel from the object to the surveyor's eye/scope : the departure of the photons from the object's surface is at time instance t_1 and the photons arrive at the surveyor's eye or scope at time instance t_2. The image of the surveyed object thus represents the object's real location Obj_{loc1} in RS at time instance t_1 whereas in the time interval $\Delta t=t_2-t_1$ the object in reality has moved in RS as a result of our planet's high velocity in RS to a new location Obj_{loc2} in RS corresponding to time instance t_2. Our planet indeed changed its location in RS during the time interval Δt and thus also the surveyed object evidently changed its location in RS. The photon information linked to Obj_{loc1} is thus clearly linked to the real location of the object in RS at the time instance t_1 (time of departure t_1 from the object) but in fact does not inform at all the surveyor about the location of the object in RS at time instance t_2 (t_2 is also the time of arrival of the photon information at the surveyor's eye or scope).

The surveyor thus is using "old" information of an "old" position of the target in RS, when targeting through a hunting rifle scope. Therefore the surveyor will fire the rifle in the direction of an "old" image of the object (apparent location of the target) and not in the real direction of the actual target's real location in RS. Again, the reader should not mix-up here the CS notion of the object's location "at rest" at the surface of our planet with the notion of the object's real location in RS. The hunter may use the CS notion and consider the target to be "at rest" at the surface of our planet, thus to be "fixed" and having no velocity at all. However, such is not the point here. The point is that the earth and thus the target on its surface move at an extremely high velocity through RS. The CS "at rest" notion thus is merely a CS type of theoretical/mathematical approach, only existing in the surveyor's mind as a theoretical representation/model linked to a theoretical graphical representation in a "reference frame at rest", also only existing in the surveyor's mind. However, the in fact virtual "at rest" approach is clearly not conform with the reality of our planet (and thus ALL objects on the surface of our planet) moving at a very high velocity through RS. In reality the earth and thus also the surveyor/hunter and target are not "at rest" at all but travel in reality at a very high velocity through RS. Therefore there will be a systematic scope targeting error from that reality of the high velocity of our planet in RS, of which the effect with respect to photons was already discussed in (1,2,3) and shown in MWF2. The surveying error linked to that real effect thus should be clearly corrected for with respect to hunting rifle scope targeting.

CPBD's evidently will vigorously deny all of this from their training in specific CS paradigms on light: CPBD's indeed claim wrongly that a photon is inheriting the light source's velocity vector component perpendicular to the photon's trajectory direction. In this case the light source is the hunted target, sending reflected/scattered photons (daylight based photons as light produced by the sun) towards the hunter who is using the information from these photons through the scope of the rifle to locate the target. Since the target is situated on our

planet, the target is evidently moving along with our planet through RS, at the astonishing orbit velocity of our planet. The target thus also moves through RS at that high velocity. In (1,2.3) it is shown theoretically and experimentally (MWF2) that a photon does not inherit the light source's velocity vector component perpendicular to the photon's trajectory direction vector. Specific CS paradigms based on light are thus flawed for that matter.

Only a material object such as the rifle bullet departing from the rifle will co-inherit all velocity vector components of its source (the rifle) but not a photon from its light-source. Strangely CPBD's even keep on claiming that a photon does not inherit ALL of our planet's velocity vector components since the CPBD's and CS would be in large trouble when claiming such: CS principles strangely only allows the inheriting of the velocity vector component perpendicular to the photon's trajectory direction ! CS does not allow the inheriting by the photons of any of the light source velocity vector components non-perpendicular to the photon's trajectory direction. CS strangely claims such in order to avoid a conflict with the CS postulate that the speed of light cannot be changed by the source velocity itself in the direction of the trajectory of the photon. It is thus extremely peculiar that CS does allow the photon to acquire the light source velocity component perpendicular to the direction of the trajectory of the photon. Indeed, a very strange characteristic of the photon since CS thus claims that a photon is only able to choose/select/inherit a very particular perpendicular velocity vector component of the light source but not the other non-perpendicular velocity vector components of the light source ... When asking CPBD's (CS) how a photon is able to physically undergo/acquire such a direction selective velocity inheritance principle there is only a total silence from the CPBD's ... Thus merely an extremely peculiar CS paradigm on photons (light) and therefore resulting in the conclusion of a totally anomalous and flawed CS paradigm on photons (light) as shown in (1,2,3) and moreover experimentally proven by MWF2. See also (1) and Chapter 13 within (1) regarding the "avoid and silence strategy" of the CPBDs.

It is important to notice from e.g. MWF2 that the amplitude of the lateral error effect in the vertical or horizontal direction from the observer's point of view is influenced by multiple parameters which determine the direction of the earth's velocity vector at a specific location:

- thus the geographical location (latitude and longitude) of the observer/target
- the time instance (hour, day, month) as a result of the season situation : "position" of the sun in the sky (e.g. "high sun's position" at noon during the summer and "low sun's position" at noon during the winter). This parameter evidently influences the angle between the earth's velocity vector direction at the location of the observer/target and the surveying direction. This is of course linked to the orbit plane of our planet around the sun, a plane being defined by both celestial objects (thus a plane which cuts the centre of the sun and the centre of the earth).

In that respect the in MWF2 the obtained lateral Lissajous type of lateral laser dot displacement at the measuring grid was mainly in the vertical direction fully corresponding to the conditions of the experiment (in this case in Mol, Belgium at 51° 11' N and 5° 06' E in the month of June with a "high" position of the sun). In order to reflect on the effect of the sun's

"position" at a specific time instance (hour, day, month) in this all it is interesting to imagine our planet's orbit plane which evidently incorporates both the sun and our planet as two celestial objects situated in that plane. In that way it is easier to reflect on the direction of our planet's orbit velocity vector orientation and to determine the amplitude and main direction (horizontal and/or vertical to the observer) of the lateral effect. A full analysis however of course needs to be done by the experts in the different fields.

5. Conclusions

In this publication a systematic error (1,2,3) is discussed with respect to two surveying applications on our planet : theodolite measurements and hunting rifle scope targeting. The research and development people in both domains are called to look into this error and to re-perform therefore as a first step the type of experiment visualized within Figure A. In (1) a number of recommendations are mentioned in order to improve the (laser) experiment. This will confirm the result. Thereafter the needed correction procedures and algorithms can be researched and developed for both applications.