On a massive anomaly through a straightforward laser experiment falsifying the equivalence principle for light.

Short and private communication/publication

Etienne Brauns[a]

1.0

Keywords: Michelson and Morley, null-result, Lorentz, Lorentz contraction, anomaly, paradigm, light, ray of light, laser, laser pulse, laser beam, photon, real space, real velocity, relativity of simultaneity, Einstein, thought experiment, light clock, relativity, equivalence principle

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 dynamic 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 this short publication/communication the experimental result of a straightforward laser experiment is presented, indicating a massive anomaly within CS with respect to the CS description of light phenomena in RS. The result of the laser experiment in fact falsifies (Karl Popper's paradigm falsification principle) the equivalence principle within CS regarding light. Publication (2) already shows the existence of a destructive theoretical anomaly which falsifies e.g. the ray-of-light concept within CS as a graphical representation of light phenomena (being used as a model within CS, e.g. as in the Michelson and Morley experiment). Evidently, when combined with the contents of (2), the experimental anomaly as described within this publication has detrimental consequences for specific CS paradigms, based on light phenomena. These paradigms include e.g. the Michelson and Morley null-result, the Lorentz contraction, the light clock etc. Multiple contemporary paradigms thus can be falsified. From the importance of the theoretical anomaly described within (2) and from the result of the straightforward laser experiment, CS should re-perform ASAP the suggested type of laser experiment in order to independently experience/confirm the existence of those major anomalies regarding the CS views on light phenomena. When being confirmed, CS will then be able to conclude and agree on the existence of flawed contemporary paradigms. From these Popper type of falsifications through anomalies, the processes as described by Thomas Kuhn in the case of needed paradigm shifts then can be started.

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 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) and the website was registered in front of a notary and, in combination with the patent text, is 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

2. Introduction : a theoretical massive anomaly

In (2) it is shown that CS uses a flawed simplistic "ray-of-light" model. Such model is e.g. applied in the light phenomena modeling approach as presented by Michelson and Morley in

their paper regarding their world famous experiment which resulted in a "null-result" :
www.absolute-relativity.be/pdf/MichelsonAndMorleyPaper1887.pdf

Publication (2) and the CS based figures MWF27/MWF26/MWF25 (figure links in Table 1) as well as the CS based MWF24 clearly reveal the inconsistencies and anomaly within the views of CS regarding photon/light phenomena. Those CS views based figures contradict and falsify the "ray-of-light" model approach used by CS.

Figure MWF23 presents 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 the dynamic presentation of MWF9 the individual trajectories of the photons from a moving laser/light source are illustrated, also in contrast with the anomalous CS view as represented by MWF5 (thus in fact MWF1 in the case of a "reference frame" moving in RS). Within MWF9 the "red" photon can be considered as a "tracer" photon, thereby enhancing the interpretation of the trajectory of a photon. MWF3 and MWF4 illustrate this further, also in contrast with the anomalous CS views as represented by MWF5/MWF1/MWF25/MWF26/MWF27/MWF24.

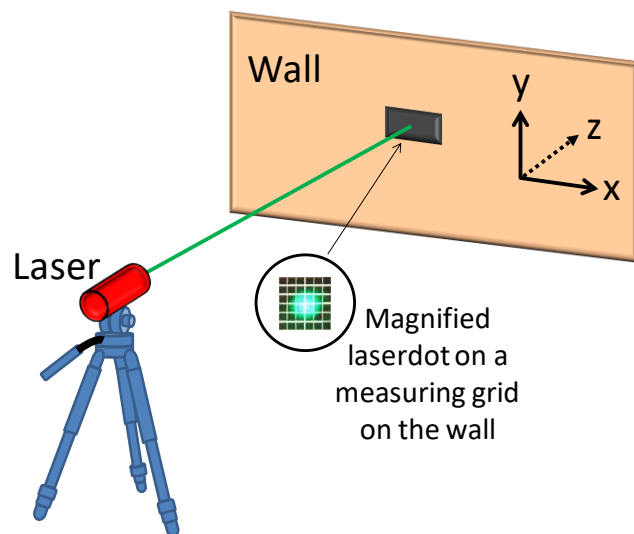## 3. An experimental massive anomaly

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

When having a totally fixed (CS : "at rest") laser set-up and a totally fixed (CS : "at rest") wall in a lab on our planet, as illustrated in Figure A, all CPBDs will state that it is absolutely correct to claim that the laser beam will create a laser dot at the wall which will be located in one fixed (CS : "at rest") location at the wall. CS indeed claims that the complete laser set-up and the wall in the laboratory room in the experimental situation within Figure are "in a state of complete rest when compared to one another". From that CS "at rest" principle CS claims that the laser dot at the wall will also be observed in one single "at rest" location. Moreover,

from a pure CS point of view our planet is in a continuous free fall mode towards the sun. Evidently the set-up as illustrated in Figure A in a lab on the surface of our planet then also needs to be considered by CS to be in a state of free fall. Since CS claims that for free fall situations the CS equivalence principle is valid for light phenomena, CS thus also claims that an observer in the lab room will observe the laser dot at the wall as being totally "at rest" at the wall (thus in a fixed location on the wall). CS indeed claims from the equivalence principle that a photon's trajectory between the laser and the wall can also be graphically represented as a fixed ray-of-light (thus a fixed straight line).

When however performing a 24 hour duration real laser experiment (of the type shown in Figure A) in RS in a room on our planet, CS claim of a fixed location of the laser dot at the wall can be shown to be totally flawed. For extensive 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). In this short publication/communication however only some basic elements of the experimental configuration and the experimental result of one experiment will be shown and discussed.

The experiment is performed during a 24 hour time interval, thus corresponding with one full rotation of our planet as to make use of the 24 hour period Lissajous type of fluctuating orientation within a laboratory on our planet of the very high orbital velocity vector of our planet. Our planet indeed shows a very high orbital velocity scalar value of about 30 000 meters per second ! It can be noted that Michelson and Morley also used the earth's orbital velocity vector orientation and that very same orbital velocity scalar value in their experiment. In the case of the Michelson and Morley experiment an interference effect (fringe shift) was targeted of which the shift calculation can also be found in Table 8.1 in (1). An interference effect is linked to the longitudinal travelling direction of light. In the laser experiment as illustrated in Figure A and discussed in detail in chapters 10 and 11 in (1) however the transversal effect as shown within MWF9 is targeted ; in the case of

- a laser set-up such as the one in Figure A, travelling at a specific velocity through real space
- assuming the validity of the representations MWF9, MWF4 and MWF3 with respect to the photon phenomena

it should be very clear that a photon travelling from the laser through RS towards the wall will need a specific RS travelling time interval as a result of the distance between the laser and the wall. It should also be very clear that the wall (in fact the complete set-up and the laboratory) also moves in RS during the photon's travelling time to the wall as a result of our planet moving at a very high velocity through RS.

When e.g. having an arbitrary distance of e.g. 10 m between the laser and the wall the photons need 3.33E-08 sec of travelling time to cross that distance of 10 m. Consider now that the laser set-up is moving through RS at 30 000 meters per second, in the x-direction to the right, as shown within MWF9. The laser's photon firing direction y is then perpendicular to the

direction x of the laser's 30 000 meters per second velocity vector. In that case it is clear that, during the traveling time of the photon from the laser to the wall, the wall at its velocity in RS of 30 000 meters per second will have travelled in the x-direction over a distance of a very significant 0.001 m = 1 mm ! (simply distance = travelling time multiplied by velocity ; distance = 3.33E-08 sec multiplied by 30 000 meters per second = 0.001 m !). From MWF3/MWF9 it is then correct to state that x_p=1mm, thus that the photon will arrive at the wall 1 mm to the left of the geometrical midpoint of the wall within MWF3. Evidently in the case that in MWF3/MWF9 the velocity scalar value of the set-up in the x-direction would be zero it is clear that x_p=0 and that the photon will arrive at the geometrical midpoint of the wall within MWF3.

It is then also clear that in a Figure A type of laser experiment, where a velocity vector orientation linked fluctuating scalar value of 0 ... 30000 meters per second is introduced, also a fluctuating location of the arrival of a photon at the wall will be observed : x_p thus would show a fluctuating value in the order of 1 mm in the example of a laser-wall distance of 10 m. This is exactly where the tremendous 24 hour rotation mode of our planet can be used as an extra ordinary experimental opportunity, in fact in an analogous way as was used by Michelson and Morley since they also used the orientation effect (by turning their experimental set-up) and the velocity scalar value of 30000 meters per second in their experiment (the calculation of their interference effect and thus the fringe shift is based on that value in their paper). In the straightforward laser experiment as reported in chapters 10 and 11 in (1) and in contrast with the Michelson and Morley target of a fringe shift, the transversal effect of the type x_p within MWF9 was however targeted. A laser experiment as illustrated within Figure A was thus performed in a time interval of 24 hours in order to obtain the full Lissajous type of velocity vector orientation fluctuation in the range of 0 ... 30000 meters per second as explained in chapters 10 and 11 in (1).

In brief some basic laser set-up configuration data, used in the experiment (see details in (1) :
- a fixed laser showing a divergence value of 0.1 mrad. See also the recommendations in (1) to improve the experimental conditions when having a more expensive laser and optics in order to have a smaller divergence value and thus even a smaller laser dot at the measuring grid (e.g. a dot smaller than 1 mm for a distance of e.g. 10 m between laser and wall (measuring grid))
- a measuring grid (white grid lines on a black background in this case)
- gridlines at 1 mm interline distance (white gridlines having a width of about 0.1 mm)
- the fixed measuring grid located at a distance of 11 meters from the laser
- laser and measuring grid completely stationary (CS : "at rest"/fixed) with respect to one another
- the laser dot being photographed by using a digital camera (fixed on a tripod)
- the time lapse procedure of taking photographs over the period of 24 hours of the laser dot on the measuring grid was automated through software, specific hardware and a computer (all USB linked)
- the numerous digital images within the 24 hours period were processed into a time lapse GIF file as to be able to present the images in motion to the human eye and

thereby clearly see the effect of the 24 h rotation of the earth (MWF2)

The result of one of the multiple and reproducible 24 hours experiments is shown in MWF2 (click link in Table 1). The Lissajous type of movement of the laser dot on the measuring grid is a clear experimental indication of the anomaly which then falsifies CS views on light phenomena, including the CS equivalence principle for light. MWF2 also supports the views within (2) on the existence of the theoretical anomaly. As already indicated in the Abstract the purpose is to stimulate researchers to re-perform ASAP and independently at a university or research centre the suggested type of straightforward laser experiment in order to experience/confirm the existence of those major anomalies regarding the CS views on light phenomena. When being confirmed independently, CS will then need to conclude and agree on the existence of flawed contemporary paradigms and move to the then needed necessary paradigm shifts in the way as reported on by Thomas Kuhn. It can be remarked that the effect shown within MWF2 of course (since not known/realized at that time) was not taken into account by Michelson and Morley in their model and therefore the effect within the order of mm's in the case of the light path length over 20 meters in their experiment could already be a very plausible reason for their so called null-result (which was moreover not a null-result since the expected signal was obtained but was considered to be too faint ; see a detailed critique in that respect in chapter 8 in (1) pointing also to the plausibility of an additional severe signal run-away from a possible amplification of the transversal effect by the multiple slanted mirrors as being used by Michelson and Morley in their set-up).

It can also be remarked that the transversal effect, thus the laser dot movement at the measuring grid, is of the order of 1 mm for a laser - measuring grid distance of 10 m. That signal size is of an order which is 1000 times the order of the size of the fringe effect (interference effect) within the Michelson and Morley experiment. The suggested experimental set-up as illustrated in Figure A is thus, in comparison, advantageous and experiment cost effective. In (1) and (2) it is already indicated that such set-up principle could eventually be an alternative to the very expensive LIGO interference set-up principle. Moreover, in the patent text and in (1) the concept of a real velocity measuring device was/is explained.

4. Conclusions

Next to the theoretical anomaly described in (2) in this publication an experimental anomaly is presented as obtained from a real straightforward experiment using a real laser in real space. The obtained Lissajous type of displacement of the laser dot at the measuring grid over a period of 24 hours (and as predicted from the fluctuating orientation of our planet's orbital velocity vector ; of 30000 meters per second) then destroys the CS equivalence principle for light. Therefore a stringent call to a university or research centre to independently re-perform the type of straightforward laser experiment as illustrated in Figure A and in that case confirm the anomaly as shown in MWF2.