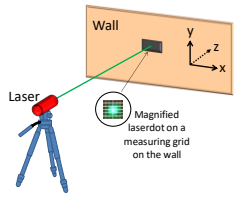

On the totally flawed contemporary light clock paradigm and on Paul Langevin's twin paradox being to the point.

Private communication/publication

Etienne Brauns[a]

1.0

Keywords: light clock, time, Langevin, twin paradox, anomaly, paradigm, photon, trajectory, real space, virtual space, reference frame, Lorentz, contraction, location, light, phenomena, ray of light, laser, laser pulse, laser beam, real velocity, real location

Abbreviations: CS (contemporary science), CPBD (contemporary paradigms believer and defender), RS (real space), RV (real velocity), MWF (My Website Figure; reference to a dynamic Figure 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)

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

Table 1: (dynamic) MWF figures and their link

MWF#	Link
MWF1	http://www.absolute-relativity.be/figures/Figure01.gif
MWF2	www.absolute-relativity.be/images2/G6_Animation.gif
MWF5	www.absolute-relativity.be/figures/Figure05_Animation.gif
MWF6	http://www.absolute-relativity.be/figures/Figure06.gif
MWF9	www.absolute-relativity.be/figures/Figure09_Animation.gif
MWF10	www.absolute-relativity.be/figures/Figure10.jpg
MWF11	www.absolute-relativity.be/figures/Figure11.jpg
MWF24	www.absolute-relativity.be/figures/Figure24_Animation.gif
MWF26	www.absolute-relativity.be/figures/Figure26_Animation.gif
MWF27	www.absolute-relativity.be/figures/Figure27_Animation.gif
MWF29	www.absolute-relativity.be/figures/Figure29_Animation.gif
MWF30	www.absolute-relativity.be/figures/Figure30_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 publication the CS light clock paradigm and Paul Langevin's twin paradox are discussed. The light clock is already discussed broadly in section 8 of (1) (at pages 193-233) and previously at the website indicated in (1). In this publication the core information from section 8 in (1) was extracted in order to demonstrate that the CS light clock paradigm is totally flawed and that Paul Langevin was right. From (1,2,3,4) it should be clear that multiple contemporary paradigms are flawed as a result of the massive experimental anomaly, proven by a straightforward laser experiment (MWF2). This publication and the preceding publications (2,3,4,5,6,7) are extracted from (1) and are intended as a series of publications in the project being indicated at ResearchGate as "*Karl Popper's type of falsification, through theoretical and experimental anomalies, of multiple contemporary paradigms based on light phenomena*". All the information in (1,2,3,4,5,6,7) and at the website was registered in front of a notary, and in combination with the patent text thus resulting in an author's copy right protection. Moreover the multiple theoretical inconsistencies and anomalies reported in (1,2,3,4,5) also clearly show that numerous CS paradigms based on light are flawed and should be reconsidered. When using photons in the analysis, this all becomes evident. The principle and result of the laser experiment was already published in the (notary registered) patent text, in (1) and also at www.absolute-relativity.be. The extended publication (1) is informing in more detail about the existence/proofs of multiple flawed paradigms within CS, as well about important applications (on our planet and in space) resulting from those views.

(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

(4) Etienne Brauns, *On the flawed Michelson and Morley experiment null-result paradigm*
Website : http://www.absolute-relativity.be/pdf/MichelsonMorley_EBrauns.pdf
Researchgate :
https://www.researchgate.net/publication/318969438_On_the_flawed_Michelson_and_Morley_experiment_null-result_paradigm

(5) Etienne Brauns, *On a flawed Lorentz contraction paradigm caused by an erroneous Michelson-Morley model and null-result.*
Website: http://www.absolute-relativity.be/pdf/Lorentz_EBrauns.pdf
Researchgate :
https://www.researchgate.net/publication/319128677_On_a_flawed_Lorentz_contraction_paradigm_caused_by_an_erroneous_Michelson-Morley_model_and_null-result

(6) Etienne Brauns, *On the inconclusiveness of the results from the Eddington 1919 solar eclipse mission to measure the bending of light.*
Website:
Researchgate :
https://www.researchgate.net/publication/319262673_On_the_inconclusiveness_of_the_results_from_the_Eddington_1919_solar_eclipse_m

ission_to_measure_the_bending_of_light
(7) Etienne Brauns, *The Mercury perihelion precession: a critique on the anomaly and a plausible additional effect of the sun.*
Website: http://www.absolute-relativity.be/pdf/Mercury_Anomaly_EBrauns.pdf
Researchgate :
https://www.researchgate.net/publication/319395513_The_Mercury_perihelion_precession_a_critique_on_the_anomaly_and_a_plausible_additional_effect_of_the_sun

2. The flawed light clock paradigm

2.1 The CS light clock paradigm explained by examples at the internet

Regarding the light clock views in CS it is important to point first to some examples of CS representations, available at the internet. A first illustration of the light clock principle can be viewed by clicking the animation at:
http://www.phys.unsw.edu.au/einsteinlight/jw/module4_time_dilation.htm

In Figure A (as a print screen from the UNSW animation), Zoe drives a car and is considered by CS as an observer "*at rest*" in the reference frame inside the car. In the back of the car there are two mirrors which are perfectly parallel to one another. A Mirror1 is located at Zoe's left side and a Mirror2 is located at Zoe's right side. Zoe and CS claim for Zoe's version (Figure A lower part) that light (photons) will be reflected exactly from the midpoint of Mirror1 to the midpoint of Mirror2, forth and back, for whatever value of the velocity of Zoe's car! Zoe and CS thus clearly claim to always observe the photons to "travel" along the straight line interconnecting the midpoints of the two mirrors in Zoe's car. In Zoe's reference frame, the line between the midpoint of Mirror1 and the midpoint for Mirror2 is thus considered in CS as the correct representation of the photons "trajectory" as observed by Zoe.

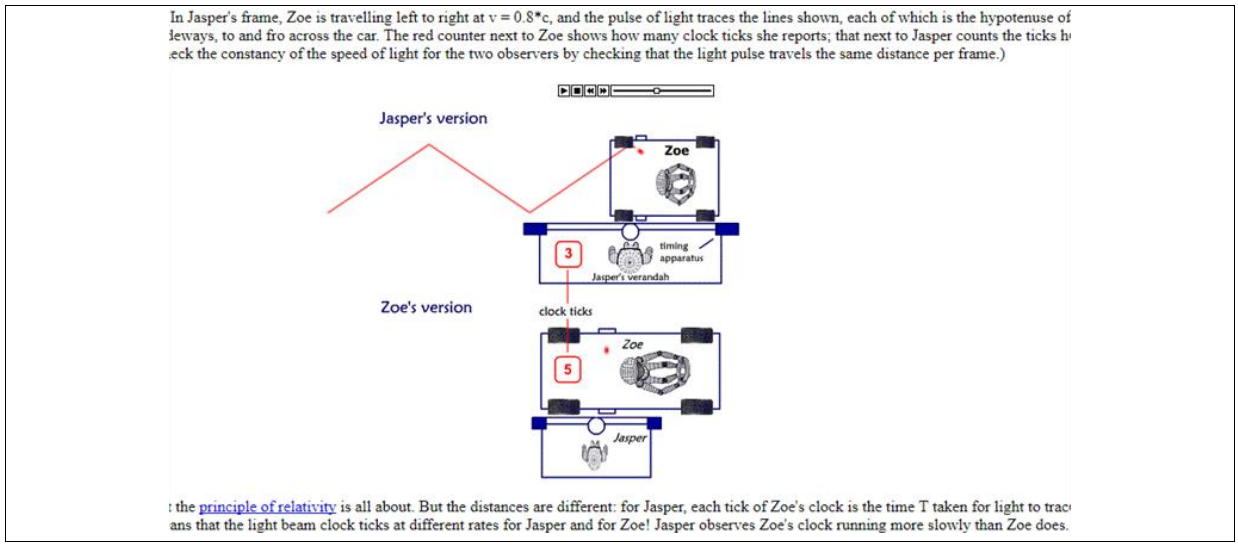

Figure A Print screen from the animation at
http://www.phys.unsw.edu.au/einsteinlight/jw/module4_time_dilation.htm

On the other hand and according to CS, Jasper can be considered to be at rest as an observer, alongside Zoe's track. According to the animation of Figure A, CS then claims that Jasper

needs to represent the trajectory of the photons in Jasper's reference frame between the two moving mirrors as a zig-zag line, as illustrated in the upper part of Figure A (Jasper's version). CS (and in an analog way Lorentz (5)) thus claims that the trajectory of the photon as "observed" by Jasper is larger/longer than the trajectory of the photon as "observed" by Zoe... Lorentz suggested to implement his contraction principle (5) to "correct" such types of difference.

The laser experiment discussed in (3) already proves (MWF2) that such CS claims (Jasper's version and Zoe's version) are in fact totally flawed. MWF2 shows the result of a real laser experiment (which was repeated numerous times producing the same, thus reproducible, result). It should be remarked here that the registration of the laser dot at the measuring grid for each experiment laser lasted 24 hour, thus one complete day. Our planet orbits around the sun in 365 days, thus a full earth rotation orbit around the sun of 360° in 365 days, thus approximately 1° of an earth's angular orbit in 1 day during a laser experiment. To put the trajectory in RS of our planet in a "linearity" perspective for a time period of 1 day, one can use the arc/chord ratio in the case of a circle and for an angle α, as a very good approximation:

$$\frac{Arc}{Chord} = \frac{\alpha}{2} \cdot \frac{1}{sin\frac{\alpha}{2}}$$

For a angle α = 1° = π/180 rad one then calculates for the ratio Arc/Chord=1.0000127. That means that the 24 h orbit trajectory of our planet shows an extremely small deviation of about only 0.001 % from a linear trajectory! During such a 24 hour laser experiment the movement of our planet in RS is thus extremely close to an inertial movement (very close to a constant velocity and very near a linear trajectory). Therefore the CPBDs cannot argue in that respect. Moreover our planet is in an continuous free fall towards the sun and consequently CS must accept that the CS equivalence principles are also valid in a laboratory on the surface of our planet. Therefore the result shown in MWF2 (3) should be impossible according to those CS principles but the laser experiment shows that CS is simply totally wrong about that. Again: MWF2 shows a massive experimental anomaly which proves that numerous CS paradigms based on light must be totally flawed. MWF2 shatters the CS equivalence principle for light.

A second example of that firm CPBDs belief in the CS light clock paradigm can be found in the 4 minutes representation at https://www.youtube.com/watch?v=dBxo1eJlLwM which gives an introduction to Einstein's relativity (including the possibility of time travel, see 2.3 regarding Paul Langevin's twin paradox) and, from the time stamp 2minutes20 seconds on, the explanation of a light clock (Figure B). Surely one must have a look at that animation of a light clock (thus one can scroll directly to the 2:20 time instance within that presentation). Obviously CS claims it to be very true that the photon travels back and forth exactly between the midpoints of both mirrors at any velocity through space of that light clock device (of course in the video it is about an artificial demo by the narrator but nevertheless that basic CS claim is essential here).

Figure B The CS views about a light clock
(print screens; for the video click here: https://www.youtube.com/watch?v=dBxo1eJlLwM and scroll to 2:20 minutes time instance with respect to the light clock)

In (2) a third example is discussed regarding the CS based representation in which two space ships are introduced at https://www.youtube.com/watch?v=KHjpBjgIMVk. The upper space ship Ship1 fires perfectly downwards in the vertical direction a laser pulse towards the mirror attached to the lower space ship Ship2. Also in this example the laser pulse is claimed by CS to perfectly hit the midpoint of the mirror attached to Ship2, for whatever speed value of both space ships (both travelling in sync, Figure C) and moreover for whatever vertical distance between both space ships! That again is un unrealistic claim made by CS and a totally flawed representation (2) of the real photon phenomena (real trajectory) happening in real space.

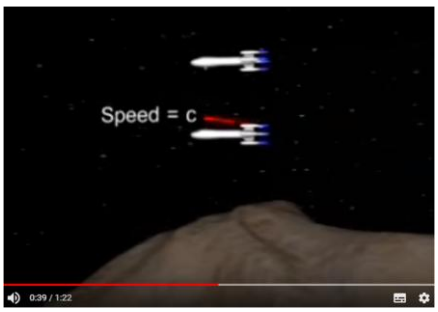

Figure C Demo by two space ships of the CS view on a light clock
(for the video click here: https://www.youtube.com/watch?v=KHjpBjgIMVk)

The three examples clearly show what CS and CPBDs believe in: the "light-clock" principle with a slower ticking clock at higher velocities in Figures A,B and C is considered to be a CS paradigm. It will however be shown further in this publication that the three, CS principles based, examples and representations of the photon phenomena are totally flawed. Thus that the CS light clock paradigm is also totally flawed.

2.2 The flawed representations by CS in virtual reference frames, of real photon phenomena occurring in real space

During the use of reference frames and the representation of real photon phenomena occurring in real locations in real space, in the virtual space of the mathematical reference frames it is mandatory that the virtual graphical model representation needs to save the real photon phenomena. From the discussions in (1-5) as well as in this publication it should become clear

that the model CS representations within Figures A, B and C actually do not save the real photon phenomena and are totally flawed.

In order to show that CS is not saving the real phenomena of the photons travelling in RS the same type of reference frame modeling approach, which was used by Michelson and Morley (4,5), is therefore used in this publication. CS still accepts the graphical model representation as introduced by Michelson and Morley in their thus still world famous paper, published in November 1887 in the American Journal of Science as Art. XXXVI with the title "*On the Relative Motion of the Earth and the Luminiferous Ether*". The Michelson and Morley paper can be downloaded here :
www.absolute-relativity.be/pdf/MichelsonAndMorleyPaper1887.pdf
(or at the internet : http://history.aip.org/history/exhibits/gap/PDF/michelson.pdf)

Figure D shows the original figure by Michelson and Morley (MM).

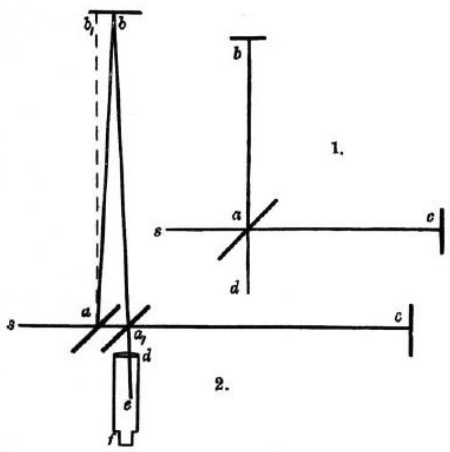

Figure D Michelson and Morley's figures part 1 and part 2 in their famous 1887 publication

Their figure part 1 is linked to an observer Obs1 who is at perfect rest and who observes the set-up, also at perfect rest in part 1. From the at perfect rest situation within the figure part 1, the photon trajectories as depicted by MM can be considered to save the real photon phenomena (4).

However, their figure part 2 is also based on the observation made by Obs1 who is still at perfect rest but who now observes the set-up moving in RS. The representation of the moving set-up in one single figure (part 2) is nevertheless rather "blurry" regarding a representation as a sequence of the events "occurring in time" (see also the more detailed discussion in (4) and the time instances introduced there) since e.g.:

- the inclined mirror is represented for two different time instances:
  - the time instance t_1 when the inclined mirror reflects the light upwards
  - the time instance t_4 when the inclined mirror receives the light back after its reflection by the upper horizontal mirror
- the upper horizontal mirror is represented for only the time instance t_2 of reflection

(evidently $t_1<t_2<t_4$)

It should be remarked again that CS still considers the representation within Figure D as totally correct. The representation in part 2 of Figure D is however based on the simplistic "ray of light" model where straight lines should represent the trajectories of "light", thus the trajectories of the photons. The simplistic "ray of light" representation within part 2 is however shown to be a totally flawed representation, thus a totally flawed model (4). From such model in part 2 of Figure D, CS thus accepts the statement that Obs1 will observe a zig-zag trajectory "ab" and "ba_1" in an analogous way as in the CS based Figures A, B and C. In that respect, e.g. in Figure A it is obvious that in Jasper's version, Jasper is considered as an Obs1 type of observer while Zoe is an Obs2 type of moving observer.

Therefore, one can introduce here a reference frame (x_{Obs1}, y_{Obs1}) linked to the observer Obs1 "at perfect rest" and a reference frame (x_{Obs2}, y_{Obs2}) linked to the moving observer Obs2 who is travelling along with the set-up.

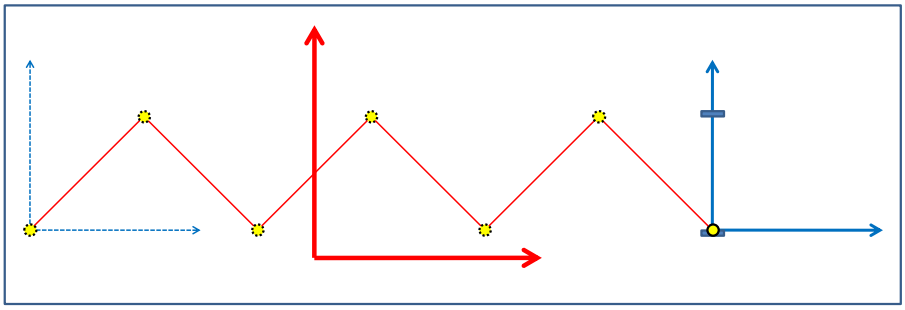

Figure E: the CS view of the light clock
(for the animated version in MWF5 click here:
http://www.absolute-relativity.be/figures/Figure05_Animation.gif)

In Figure E an image, as extracted from the animation within MWF5, is presented. The web link in the title of Figure E can be clicked to view the animation MWF5. In MWF5 two parallel horizontal mirrors are moving horizontally in sync at a constant velocity. The Obs1 reference frame (in red) is the Obs1 at rest reference frame. The Obs2 reference frame (in blue) is linked to Obs2 who is travelling along with the moving set-up. Since the mirror set-up moves at a constant velocity in one direction, the Obs2 reference frame is considered by CS as an inertial one. Evidently the reference frame of Obs1 is also considered by CS as an "inertial one" since it is at rest. According to CS, Obs1 should observe a photon to be reflected forth and back, exactly between the midpoints of both mirrors! Therefore CS claims that Obs1 will observe a zig-zag trajectory of a photon. As a result, CS claims that Obs2 will always observe the photon to travel along a straight line interconnecting the midpoints of both mirrors for whatever velocity of the set-up.

That view by CS and CPBDs seems to be extremely trivial to the CPBDs and as a result, is still considered by CS as a paradigm. That "triviality" and paradigm in a CPBD's mind however is totally flawed, e.g. (2,3), and belongs in the collection, within the history of

science, of totally flawed paradigms such as e.g. the geocentric paradigm. Flawed and discarded paradigms (see the research of Thomas S. Kuhn) in the history of science were often based on a state of mind of an observer being linked to an expectation based approach, thereby creating a fictitious and virtual representation of the real phenomena occurring in real space. In the case of the simplistic geocentric paradigm the paradigm defenders stated for centuries that it was trivial that any observer could simply see the sun moving from the East in the morning to the West in the evening. The paradigm defender thus claimed at that time that the sun was rotating around our planet since the paradigm defender stated that such was "trivial" from the "observation". In an analog expectation state of mind a CPBD claims that a photon (or laser pulse) is being reflected forth and back along a straight line interconnecting the midpoints of both parallel mirrors (e.g. "observation" by Zoe in Figure A), for whatever velocity of the set-up. With respect to Figure E, the representation indeed is merely based on an expectation of the human mind caused by inter alia, the CS "ray of light" model by which the CPBD's mind dictates the light to "travel" from the midpoint of Mirror1 to the midpoint of Mirror2. That "ray of light" linear model thus dictates Obs2 to always observe the light to travel forth and back between those two midpoints for whatever value of the velocity of Obs2's system. That view however is totally incorrect, as shown by the result of a laser experiment discussed in (3) and presented in MWF2.

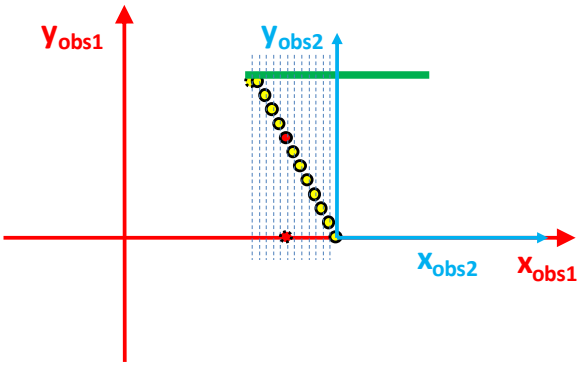

Figure F: a valid representation of the photon phenomena
(for the animated version MWF9 click here:
http://www.absolute-relativity.be/figures/Figure09_Animation.gif)

The result of the laser experiment, as discussed in (3), indeed proves that the representation within MWF9 (see the still image in Figure F, extracted from the animation in MWF9) is a valid representation of the photon phenomena. Again an observer Obs1 at rest is linked to the reference frame at rest (in red) while a moving reference frame (in blue) is linked to an observer Obs2 who travels along with the set-up. In the set-up, a laser is located in the $(0,0)_{Obs2}$ origin of the moving reference frame and thus moves along with Obs2 at a constant velocity (the blue Obs2 reference frame is an inertial one). The laser produces a series of single photons (or e.g. femtosecond laser pulses) in time. By clicking the web-link of the animated image MWF9 in the title of Figure F the travelling phenomena of the single photons can be viewed. Symbolically, there is a red witness photon implemented in the series of photons as to better observe (as an Obs1 type of observer) the location of the photon in time and also the original launch location of the "red" tracer photon. Also the arrival position of a photon at the "wall" (or mirror or ceiling or...; in green) can be better observed/interpreted in

this way. Obviously, this MWF9 representation fully clashes with the CS view. CS claims (as in the case of the CS based Figures A-E) that all photons must always arrive in the midpoint M (Figure MWF10, see below) of the "wall" (or mirror or ceiling or ...), thus that Obs2 must observe all photons to be situated and to travel perfectly along the y_{obs2} axis to that midpoint M. Again, the latter view is contradicted experimentally by a laser experiment (3) (MWF2). Moreover, also theoretically (2; MWF24,MWF26,MWF27 in Table 1) it is shown that the type of CS view, as defended in the CS based Figures A-E, includes multiple inconsistencies which prove that such CS view must be totally flawed.

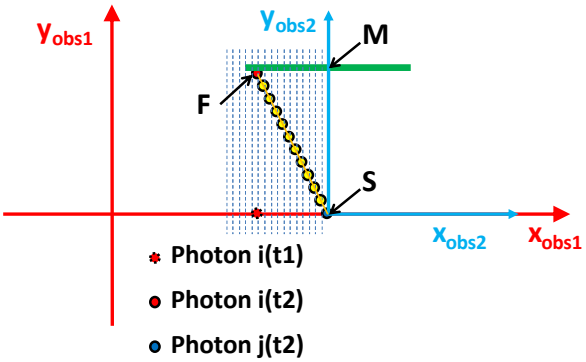

Figure MWF10
(www.absolute-relativity.be/figures/Figure10.jpg)

In the animation within MWF9 the trajectory of each individual photon/laser pulse is illustrated. The observation by Obs1 of the movement of the “red marker” photon/laser pulse is most important. The original launch position of that marker photon/laser pulse in RS (RS as represented by the reference frame (x_{Obs1},y_{Obs1}) in red of Obs1) is indicated through a red dotted circle on the x_{Obs1}-axis. That dotted circle has of course a fixed position in the reference frame of Obs1. One can call that launch position/location e.g. $x_{Obs1,red}$. It is clear that the location in RS of the red marker photon/laser pulse at whatever time instance is perfectly on the line perpendicular to the x_{Obs1}-axis and through the dotted red circle in the position $x_{Obs1,red}$ on the x_{Obs1}-axis. From MWF9 the Figure MWF10 is produced.

From the preceding, Obs1 realizes that (s)he can no longer represent in the reference frame (x_{Obs1},y_{Obs1}) the photon's phenomena by e.g. one simple geometrical line, as a “ray of light”. If Obs1 would e.g. state that the line SF in MWF10 represents the “ray of light” then Obs1 clearly does not save the phenomena of the individual photons. Obs1 then indeed would claim the “light to move along SF as a ray of light” which obviously (as can be understood from the animation within MWF9) is totally wrong and fictitious regarding (a correct location and time labeling of) the real phenomena of individual photons, all travelling in separate trajectories, but all in a direction perpendicular to the x-axis. None of the photons is moving along the SF line segment and therefore a CS type of "SF ray of light" model is totally flawed. The line segment SF could be called, at the most, a collection of photons which all travel individually in their own vertical trajectory upwards and which therefore, as a collection, give the human mind the "impression" that SF is a "ray of light". That impression is thus only a theoretical and fictitious construction of (and in) the human mind and is clearly not representative for the real phenomena with respect to the real photons travelling through RS. SF as a trajectory is an

illusion in an analog way as the geocentric paradigm illusion. The line segment SF as a "ray of light" does not save the real photon phenomena at all.

Light thus should not be modeled through simple geometrical lines as e.g. Michelson and Morley did in Figure D but, from the particle (photon) point of view, on the basis of the photon/quanta related behavior. The line SF does not at all represent such a quanta (photon) related behavior and is thus incorrect as a graphical representation. In reality, a photon does not travel over the distance between S and F within MWF10 but as indicated over a distance conform to the two positions of Photon "i" at time instances t_1 and t_2, thus between the positions Photon $i(t_1)$ and Photon $i(t_2)$ in MWF10. The value of that distance is of course equal to the value of the distance between M and S in MWF10, being simply the perpendicular distance between laser and "wall" (or mirror or ceiling or ...).

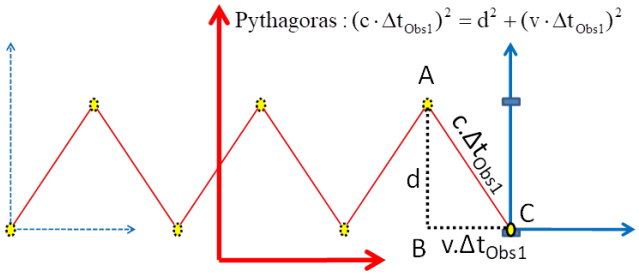

Figure MWF6
(http://www.absolute-relativity.be/figures/Figure06.gif)

From the representation in MWF9 and MWF10, Obs1 thus recognizes the fact that each photon in Figure E and MWF5 in reality is not observed by Obs1 to travel the slanted distance AC (as claimed wrongly by CS) in MWF6 but is observed by Obs1 to always travel exactly the pure perpendicular distance "AB"="d" between both mirrors for whatever value of the velocity v of the set-up of the two mirrors. The correct observation by Obs1 is thus that a photon, being launched perpendicular to the x-axis, indeed has not at all a zig-zag type of trajectory (presented wrongly by CS in the CS based MWF5) between the midpoints of both moving mirrors in RS. The CS paradigms/representations of a zig-zag trajectory such as presented in the CS based MWF5 and CS based MWF6 are thus totally flawed.

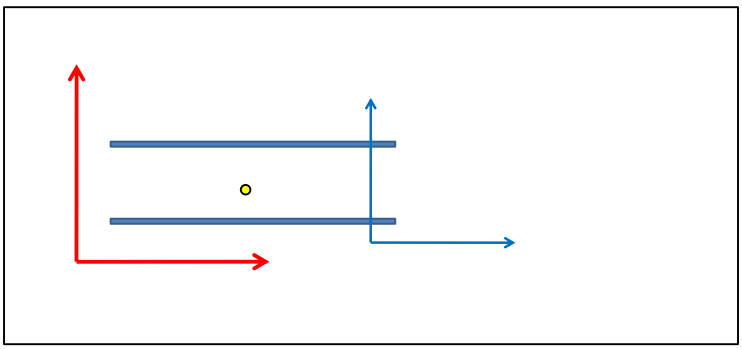

Figure MWF29 (for the animation click the link)
(www.absolute-relativity.be/figures/Figure29_Animation.gif)

In fact, a correct representation of the observation by Obs1 of a photon being reflected forth and back between two moving parallel mirrors can be viewed in the animation MWF29. Evidently the frequency of the reflections forth and back will stay the very same and is independent from the velocity of the mirrors set-up. As a result, the dramatic conclusion is that the CS light clock paradigm view as presented within Figures A, B, C and the CS based MWF5 is totally flawed. MWF29 shows the correct principle of the functioning of a light clock. A photon is reflected forth and back between the two parallel mirrors. Obs1 (red reference frame) will observe the photon to travel forth and back in the y-direction in a fixed x_{Obs1}-position. That means that Obs1 will observe the photon being reflected forth and back up to the moment that the photon leaves the mirror set-up. This is exactly what will occur in such a set-up with two parallel mirrors in a laboratory on our planet. Since the earth moves at a very high velocity through RS it is a fact that an observer in the laboratory is an Obs2 type of observer, since Obs2 and the laboratory in reality are obviously not at rest in RS. When applying MWF29 it is thus clear that the reference frame of the observer in the laboratory is an Obs2 type of reference frame (in blue). Therefore the observer Obs2 in the laboratory will observe the photon (or laser pulse) to be reflected forth and back between the two mirrors until the photon (or laser pulse) leaves the mirror set-up (MWF2 proves that principle). The latter view is the correct view and evidently totally clashes with the flawed CS view in Figures A, B and C. The flawed CS view about a light clock is also shown in MWF30 (Figure G represents only an extracted still image from MWF30; therefore one needs to click the link in the title below Figure G to view the full MWF30 animation) in the upper part of the animation. The upper part of the animation fully represents the CS view which claims the photon to travel according to the CS principles within Figures A,B and C. According to those CS principles the photon must be reflected precisely between the midpoints of the two parallel mirrors of the light clock. As a result CS claims that the Obs1 observer should observe the photon to zig-zag in the Obs1 reference frame. That CS claim is totally flawed. In the lower part of the animation MWF30 therefore the correct view is illustrated: the photon is reflected forth an back by the two parallel mirrors of the light clock while Obs1 however observes the photon to travel on a fixed vertical trajectory (dotted red line) in the Obs1 reference frame! The photon therefore will leave the light clock at a specific time instance as illustrated in the lower part of MWF30!

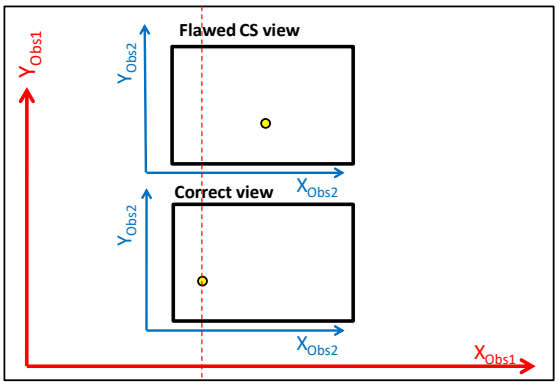

Figure G (for viewing the actual animation MWF30 one needs to click the link)
(www.absolute-relativity.be/figures/Figure30_Animation.gif)

Consider now in Figure H the schematics of a light clock. A laser sends individual laser pulses to the mirror which reflects them towards the detector. The detector counts the incoming pulses. Such a light clock is made available to Obs1. Obs1 and her/his clock are at rest. Also Obs2 receives a light clock of the same build. Obs2 and her/his light clock move at a constant velocity in RS. From the preceding considerations and in total contrast with the publications in CS literature, both light clocks will evidently produce no difference at all in clock readings (frequency of the clock ticks/counts) by Obs1and Obs2 since each photon/laser pulse travels exactly the very same distance between the mirror and the detector as indicated in MWF29 and MWF30 (correct view). The flawed CS light-clock paradigm (Figures A, B, C, E, MWF5 and CS flawed view in the upper part of MWF30) thus needs to be abandoned.

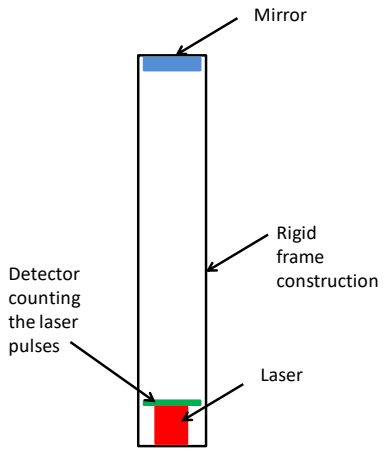

Figure H Laser pulse clock

With respect to the views of Obs2 about the representation (according to the views within CS) within MWF5 and MWF6: Obs2 first considered from the CS views that a photon/laser pulse is being reflected back and forth perfectly from the midpoint of the first mirror to the midpoint of the second mirror, and vice versa. This is however a completely wrong representation within the mind of an CPBD type of Obs2, caused by the "CS trained image" within the mind of Obs2 that “both mirrors and Obs2 are all at rest”, comparable to the situation as depicted by (the CS based) MWF1 (see below) where the laser pulse or Photon1(t_1) departing at the time instance t_1 in the origin (0,0) of the reference frame (x_{obs2}, y_{obs2}) is expected by the CPBD to perfectly arrive at the time instance t_2 at the midpoint of the opposing wall (Photon1(t_2)). A CPBD type of Obs2 in a laboratory on our planet, while standing "at rest" according to CS next to such a fixed set-up "at rest" according to CS, indeed thinks from her/his CS training that (s)he and all “non-moving” laboratory items are “at rest” according to CS principles while however not realizing that the complete laboratory room, since located on our planet, in reality is travelling at a very high velocity through RS. The (in reality Obs2 type of) CPBD is thus convinced that Figure MWF1 can be applied. That is however countered by the laser experiment as discussed in (3) and proven by the result shown in MWF2. So, from that CPBD's "at rest"-illusion, the CPBDs were/are convinced (from their training in CS) that they “must” observe a “ray of light”, being reflected between the two parallel mirrors, to be reflected forth and back precisely between the midpoints of those two parallel mirrors... That is what the CPBDs believe in but they are totally mistaken in their view.

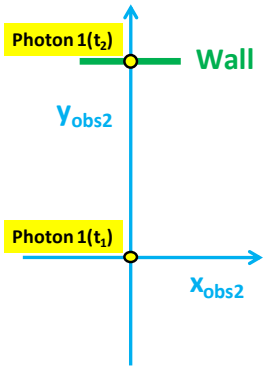

Figure MWF1 based on CS principles
(http://www.absolute-relativity.be/figures/Figure01.gif)

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phy of science, a Gestalt switch. For example, Kuhn (1962) attributes progress in science to a shift from one paradigm to another. The mechanism for this change is roughly as follows: an established paradigm (e.g., Bohr's theory of the atom) on which normal science is practiced gradually enters a period of crisis owing to its inability to solve certain problems that the leaders of the science community deem to be key problems (e.g., the 1924 data on dispersion and the vexatious anomalous Zeeman effect). The crisis, Kuhn (1962) writes, is "terminated not by deliberation and interpretation but by a sudden and unstructured event like a Gestalt switch" (e.g., Heisenberg's discovery of the matrix mechanics). Kuhn continues: "Scientists then often speak of the 'scales falling from the eyes' or of the 'lightning flash' that 'inundates' a previously obscure puzzle, enabling its components to be seen in a new way that for the first time permits its solution." Some of the pioneers of the quantum theory

Reconsidering this all: CPBDs need what is called by Thomas Kuhn a "Gestalt switch": (https://books.google.be/books?id=CbHfBwAAQBAJ&pg=PA301&lpg=PA301&dq=gestalt+switch+physics&source=bl&ots=6o7NBaCRP2&sig=1SGHXdI4KOhGyd51Th0BpflfsKo&hl=nl&sa=X&ved=0ahUKEwj15u3mmY_OAhUiKsAKHeGyD18Q6AEILjAC#v=onepage&q=gestalt%20switch%20physics&f=false) (in Kuhn's writings about the History of Science and about paradigm shifts). Remark below Kuhn's indication "*Scientists then often speak of the scales falling from the eyes or of the lightning flash* ...": in this publication regarding light/photon phenomena and the flawed CS paradigms based on light, this is surely an extremely good example of an appropriate metaphorical language by Kuhn...

An acceptable graphical representation which combines both the reference frames of Obs1 and Obs2 is already discussed and illustrated in MWF9 and MWF10. The representation within the reference frame of Obs1 of photon trajectories perpendicular to the x-axis within those figures saves the phenomena of the photons. MWF10 could be called a "photon-time based representation of the photon's phenomena" since it shows the time instances and the corresponding position of one photon. The linguistic model on the basis of the red marker photon/laser pulse in MWF10 could e.g. be : "*a photon/laser pulse "Photon i" departed from the laser in the past at time instance t_1 in position Photon i (t_1). The photon arrives now (at t_2)*

at the position Photon i (t_2). The vertical distance between the position Photon i (t_1) and the position Photon i (t_2) corresponds <u>*in value*</u> *to MS in MWF10. The horizontal distance between the position Photon i (t_1) and the y_{obs2}-axis corresponds in value to MF in MWF10. The distance represented by MF in MWF10 is equal to the horizontal displacement of the reference frame of Obs2 as observed within the reference frame (at perfect rest) by Obs1, thus equal to the time interval $\Delta t=t_2-t_1$ multiplied by "v" being the* <u>*real velocity*</u> *of the set-up in* <u>*real space*</u>*.*"

The latter points to the feasibility of the concept of device, measuring the real velocity of a material object in real space as already explained in the patent text, in (1) and at the website. That real velocity measuring device will moreover be the subject of the next publication in this series.

The representation within MWF10 also shows that each photon/laser pulse travels in reality in RS the very same vertical distance as the red marker "Photon i", being equal in value to the distance MS. This must be true in the reference frame of Obs2 as well as in the reference frame of Obs1! So there one has also the real fact that the speed of light is constant in whatever reference frame! The real distance that the photon travelled in RS can be "read" in both reference frames but only if the readers (observers) know how to correctly interpret the real facts in their reference frames (please read further what is meant here)! If Obs2 would finally accept such (while experiencing a profound Gestalt switch!) but then would still fall briefly into a pitfall of wrong reasoning by claiming that the red marker "Photon i" in the frame of Obs2 then must have travelled "sideward to the left" from S (where the laser is positioned) towards F, Obs2 then again forgets that the red marker "Photon i", being considered here, was launched earlier by the laser at the time instance t_1 in position "Photon i(t_1)" in RS (symbolically represented by the red dotted circle on the x-axis): it is thus NOT launched in the position S(t_2) (!) in RS and only arrives, later than the time instance t_1, at the time instance t_2 at the wall (or mirror in that case) in MWF10.

If Obs2 would continue to have doubts then Obs2 should reflect on the paradoxes that:

a) if Obs2 keeps on claiming that in the Obs2 frame the red marker photon/laser pulse was "launched in S" and thus travelled the distance SF in the Obs2 reference frame, Obs2 would then deny the reality of the shorter real trajectory in RS as explained in MWF9 and MWF10. The reference frame method of Obs2 is not a tool for Obs2 to force an illusion, existing in the human mind, upon reality but is a tool intended to represent and save the real photon phenomena occurring in RS. See also "b)" further.

b) then Obs2 would also encounter the mind boggling problem of having a photon departing now (t_2) to depart in the very same position in RS as the red marker photon already did in the past (t_1) or vice versa…?! That would mean that both photons "would be present" or "have been present" in the very same location in RS at the very same time instance, which of course is impossible/nonsense and surely does not save the real photon phenomena! [that should finally convince Obs2 here as being very

wrong when insisting on considering SF to be the travelling distance of a photon and also should convince Obs2 that such would simply be an illusion within the mind of Obs2]. That Obs2 needs to fully understand this impossibility, is evidently of key importance. If Obs2 still does not show a Gestalt switch by now then regrettably Obs2 will never, and will continue to be a CPBD (regarding light phenomena) and will continue to believe in and defend her/his totally flawed contemporary paradigms... Obs2 then will not have understood that the actual problem with respect to the multiple flawed CS paradigms in fact lies within the Obs2 reference system itself. As I indicate in (1): "*In the contemporary mathematical reference frames it is even impossible to graphically represent correctly a photon's past location in RS in a reference frame, linked to an observer such as Obs2 moving in RS*". See further.

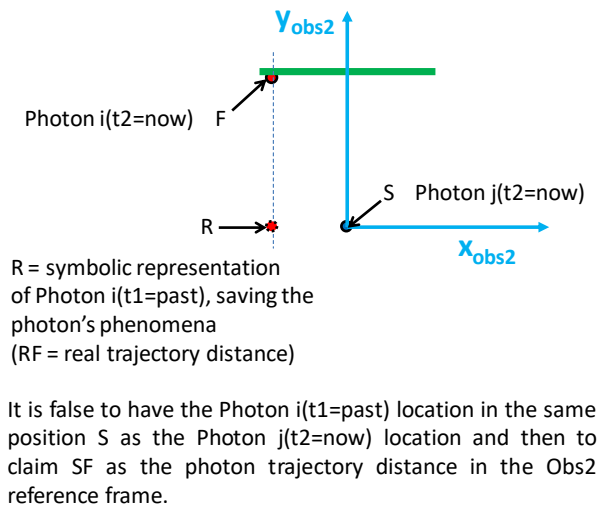

Figure MWF11
(http://www.absolute-relativity.be/figures/Figure11.jpg)

I assume however that Obs2 now indeed finally experiences a real strong Gestalt switch and then becomes convinced that also in the Obs2 reference frame the real (non-illusionary) travelling distance of the red marker photon/laser pulse should be the very same distance observed by Obs1 (of which the value is equal to the value of MS). In order to achieve the correct state of mind Obs2 to comprehend this, Obs2 needs to make an extremely strong abstraction and consider a symbolical Photon i(t_1) virtual location in her/his own reference frame. The details of that abstraction in the Obs1 and Obs2 reference frames are already explained in (1). In (1) a call is made to CS to look into an appropriate and adapted way to tackle that kind of abstraction with respect to the representation of the dotted Photon i(t_1) location within the reference frame of Obs2. A complete new mathematical approach will be needed. Suggestion: eventual a mathematical transformation approach within the reference frame of Obs2 itself while using "virtual" (symbolical) coordinates (such as the symbolical R representation in Figure MWF11 since it is impossible to directly/correctly represent the Photon i(t_1)'s past location in RS in the Obs2 reference frame!). Such new mathematical transformation approach certainly has nothing to do at all with the Lorentz transformations which are totally flawed since the Lorentz transformations are founded on totally flawed CS paradigms, based on light.

Whatever the type of an adequate new mathematical approach with respect to the Obs2 reference frame, all this results into a firm conclusion by Obs2 and Obs1 that the light velocity is indeed constant in both reference frames but on a totally different basis and from a totally different interpretation when compared to the way that Einstein postulated such (including the Lorentz contraction). In fact, from that perspective, Einstein's postulate and the Lorentz contraction are defined in a totally erroneous way since being based on flawed paradigm principles regarding photons. It was Einstein who proved the existence of photons (Einstein's specific paper on the photoelectric effect) and even received a Nobel Prize for that (Einstein did not receive a Nobel Prize for his relativity theory). Therefore it is very peculiar that Einstein never reasoned in his thought experiments on the basis of photons (quanta) and thus missed an alternative point of view as discussed in (1-7) and in this publication.

2.3 The flawed CS "*possibility to time travel into the future*" paradigm

The relativity approach, the CS light clock paradigm and the Lorentz contraction lead to the very peculiar conclusion in CS that travelling in the future would be possible by travelling in a spaceship at a velocity near the speed of light (time would run less fast in the space ship according to the Lorentz contraction) and thereafter returning to the launching location on earth (time has run faster on earth during the ship's voyage). Please note that this concept (in principle) of time travel into the future is accepted in CS to be completely true on the basis of the CS relativity paradigm, as claimed in:
https://www.youtube.com/watch?v=dBxo1eJlLwM!

Paul Langevin already introduced in 1911 a thought experiment which severely challenge(d)(s) Einstein's theory. Langevin's thought experiment is straightforward. Consider a twin called John and Steven. They are 30 years of age. There are two space ships A and B next to one another in space. John is present in A and Steven in B. John then starts the engine of A and ultimately travels through space at a velocity close to the speed of light. Steven within ship B "stays" and will wait for the return of his twin brother John. According to the Lorentz contraction formula it is possible to calculate the contraction of time within the space ship A: at e.g. 95 % of the speed of light, time for John will slow down, when compared to Steven in B, with a factor of about 3.2. Assume that John travels a total of 20 years (20 years as experienced by Steven who was floating in B in space all that time) through space. John is returning after that period and he will thus "find" his brother Steven to have aged 20 years (Steven thus became 50 years of age) during John's space travel while John himself only aged about 6 years and thus is only 36 years of age when both brothers meet again. This effect is considered by a CPBD to be indeed a reality in the case that there would be a possibility for John to travel at that high speed... So a CPBD is really convinced about the correctness and reality of the Lorentz contraction paradigm ... CS claims that John has travelled to the future since he will meet his twin brother Steven at age 50 while John himself is only 36 years of age... That "travelling to the future" principle is indeed defended by CPBDs as "very real" and true. A CPBD will of course also point to the "numerous experimental proofs" of time slowing down with velocity on the basis of accurate "atomic clock" measurements but then

again: the anomalies described within e.g. (2,3) and this publication then also point to the necessity to re-investigate such so-called "numerous experimental verifications" and to consider other possible/valid explanations for their results.

Now the paradox by Paul Langevin: he stated that in relativity it does not matter to consider John as the travelling brother since from a relativistic point of view it is very clear that John can consider his brother Steven to move away from him and to consider himself as "at rest". So according to Langevin and relativity it is no problem at all to consider John to observe that his brother Steven in Steven's space ship is in fact travelling at 95% of the speed of light during 20 years. As a result, after 20 years it is clear from relativity theory that John then becomes 50 years of age while Steven then only aged about 6 years. This is Paul Langevin's twin paradox. One can of course find in literature or the internet the CPBDs "solutions" to "explain away" this paradox. But from the discussion in 2.2 it must have become very clear that John and Steven will read from their light clocks the very same value since the velocity of their space ships have no effect at all on their clock readings. Paul Langevin was to the point and time travel into the future is simply an illusion in the human mind, since being based on flawed paradigms in CS ...

Another extremely severe paradox can be thrown in here: since a photon travels at the speed of light, a photon's own "internal" time thus should not have progressed (according to the Lorentz contraction) from the moment that it was travelling. Therefore e.g. all photons arriving from deep space at the Hubble telescope should show an "internal" time difference $\Delta t=0$ between time of departure and time of arrival at the telescope… ?!!! For any photon: it just departed and immediately arrived since they always travel at the speed of light to the very far future in a blink?! Since photons travel at the speed of light they indeed must be the ultimate and instant time travelers to the future, all according to the Lorentz contraction paradigm as supported by CS. This is then valid at this very moment for any existing photon? Even for the ones which departed billions of years ago and now arrive at the Hubble telescope; remark deep space observations of stars being billions of years old: these photons internal clock indicates a travel time of 0 seconds ?... An astronaut travelling at the speed of light would thus also not age since time stands still in the astronaut's reference frame. Such astronaut thus would arrive immediately at any location in RS. The ultimate travelling into the future and towards far locations in outer space... A severe paradox...

3. Conclusions

The CS view on the light clock is totally flawed and the CS light clock paradigm should be abandoned. The twin paradox by Paul Langevin is also to the point. The CPBDs belief in the CS paradigm of the possibility of time travel into the future is a fictitious view, only existing in the mind of a CPBD and totally disconnected from the reality in real space. From (1-7), the website, this publication and at least two further publications (on the feasibility of a real velocity measuring device (clashing with Mach's relativity view) and on the flawed relativity of simultaneity paradigm by Einstein) all those paradigms in the end will need to be declared flawed and will need to be abandoned. The tenacity however of CPBDs to hold on to and to

defend those paradigms however is very large, as indicated within section 13 of (1). The tenacious illusions (Lorentz contraction, CS light clock view, etc....) in those paradigms can however be countered and revealed through the re-performing at a university or research centre of a straightforward laser experiment of which the result is shown in MWF2 and explained in (3). The hiding in silence strategy by CPBDs will be breached at some point in the (near) future, as a result. The consequences for specific CS paradigms based on light will be very large since multiple of those CS paradigms will need to be erased.